

February 1962
Vol. 6, No. 10
35 cents

Precision SHOOTING



a magazine for Shooters by Shooters

Precision Shooting is published monthly by Precision Shooting, Inc.

Editorial and business office at 64 Depot Street, Lyndonville, Vt.

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Subscription rates:—To the U. S., Canada and Mexico, 1 year \$4.00, 2 years \$7.00, 3 years \$9.00. All other countries \$1.00 per year additional.

Change of address requires 30 days' notice.

Place of Publication—Cowles Press, Inc., 83 Eastern Ave., St. Johnsbury, Vermont. Second-class postage paid at St. Johnsbury, Vt.

THE COVER PHOTO

One of the heavy bench rest rifles as it is shot on one type of the precision mechanical rests. The rifle weighs 24 pounds with scope attached, which is not excessively heavy for this type of rifle.

The shooter is Al Walter of St. Louis, Mo., one of the NBRSA directors. With this rifle he broke a long standing bench rest record last June, shooting a 10-shot group at 100 yards range which was officially measured as .1883 inch.

WHY?

It appears to be quite generally conceded by both conventional target shooters and the high-velocity handgun fans that half-jacket handgun bullets do not give acceptable accuracy when fired with the light charges that are desirable for conventional target competition at 25 and 50 yards. It does seem quite generally that the half-jacketed bullets do deliver excellent accuracy in near maximum Magnum hand gun loads. The question that bothers me, and probably no few others, is WHY these half-jacket bullets do not give satisfactory accuracy in light target loadings. It may be that some of our ballistically knowledgeable readers can give us a factual explanation for this behavior. If so, the information would be welcomed by a considerable number of us.

I readily admit that other than what I read I know very, very little about handguns and handgun shooting, but I am interested and often curious, so, here is another question.

Has anyone done any experimenting with full-length jacketed bullets in light charge, low velocity loadings in revolvers? If so, how do the results, accuracy-wise, compare with half-jacket bullets with similar charges? If no one has tried this it might be an interesting experimental project. I believe the full length jacketed bullets are presently limited to handgun .22, .25, .44 and some of the auto pistol calibers.

I have done a very considerable amount of shooting the jacketed rifle bullets I make with very light reduced loads and, with any charge that will stabilize a particular bullet, have obtained accuracy equal to or better than I have ever been able to with cast bullets I have shot with similar loading.

Revolvers being quite different than rifles, it is quite possible that bullet behavior may differ in the two weapons. If that is so, I for one, would like to know HOW and WHY.

Perhaps I am only publicly displaying my ignorance but I'm humble enough to willingly do that in an effort to learn something.

PHT

LONG SERVICE RECOGNITION

Two members of the Wilkes-Barre, Pennsylvania, Rifle & Pistol Club, Inc., were recently given special recognition by a resolution adopted at the Club's annual meeting. It was resolved that the outdoor range of the Club be named and henceforth be known as the "Frohm Range of the Wilkes-Barre Rifle & Pistol Club."

Harry J. P. Frohm and his brother Frank Frohm have long been known for their shooting enthusiasm and active participation in tournaments through the East. They are charter members of the Wilkes-Barre Club, organized 38 years ago, April 1923. At least one of the Frohm boys is always an officer, both provide instruction in pistol and rifle marksmanship and both have been constant supporters, morally, physically and financially in keeping this 70 member club a successful organization. They are Life Members of the NRA.

The Frohm Range comprises 106 acres of land and is located about 17 miles south of the City of Wilkes-Barre, Pa. The land was purchased in 1951 and has been in process of improvement ever since. There is a masonry club house, concrete-walled spring, 300 meter range, 200 yard, 100 yard, 100 meter, 50 yard and 50 meter target lines. There are 30 benches for rest shooting, 52 small-bore firing points, underground wiring to the 100 yard line, a control tower and a statistical office. The entire installation is wholly owned by the Wilkes-Barre Rifle & Pistol Club, Inc.

It is doubtful that the W-B Club could have had its long period of success without the support of the Frohm boys. Harry is presently serving as Secretary-Treasurer.

NORTHERN CALIFORNIA GALLERY RIFLE CHAMPIONSHIP

The 11th Annual Northern Calif. Championship Gallery Tournament was fired on the Willows Rifle Club range Jan. 27 and 28th. A capacity crowd of 120 shooters battled it out in all classes for the many awards. For the 2nd year in a row Bob Wood of Ukiah, Calif. was the winner with a 793 out of 800. He fired a 200x18 Prone, 200x16 Sitting, 198 Kneeling and a 195 Off-hand. The high Expert, with a score that would win a great many matches, was Ludd Johnson of Richmond, Calif. with a 778. The high Sharpshooter was Richard Bassett of San Francisco, with a 776. Rich also won the "Bud Jensen Memorial Trophy" given for the High Junior shooter. High Marksman was Robert McClelland of Pleasant Hill, Calif. with a 759. High Lady was Virginia Bailey of San Francisco with a 769.

THE AGGREGATE TOP TEN

Bob Wood	793
Fergus Ward	789
Gordon Taras	788
Chris Petersen	787
Ken Cummins	785
Gerald Maloney	784
Chet Bartolomei	783
Victor Zimin	783
Donald Werner	783
Irvin Brown	780

The Championship Team was the Albany Rifle Club who fired a very respectable 785. They were led by Chris Petersen who fired a 198. Other team members were: Gordon Taras 197, Fergus Ward 196 and Fred Forster 194.

A close 2nd and the High Master team was Ukiah R&P Club #1 with a 782. Ken Cummins was high with a 199, followed by Bob Wood 196, Irvin Brown 194, Rod Palmer 193.

High Expert team was Pacific Junior Rifles #1 with a 765. Team members

were: Robt. Knight—194, Joseph Dugan—193, Harry Littell—189, Virginia Bailey—189.

High Sharpshooter team—Pacific Jr. Rifles #2—750. Team members were: Richard Bassett—192, Ed Finerty—188, William Klindera—187, Larry O'Brien—183.

High Marksman Team was Pacific Rifles #2—719. Team members were Al Cook—191, James Stokes—184, Nick Wilson—182, Ed Duffy—162.

There was a total of 22 teams entered.

For the first time in several years the Sharpshooters outnumbered the Experts. There were 32 SS and 24 Experts, 44 Masters and 19 Marksmen.

The winner of the entry prize on Saturday (a dressed Suckling Pig) was Coy Daugherty of Vandenburg AFB. Bruce Acedo of Woodland was the winner of a Dressed Lamb on Sunday. There are given in addition to relay prizes, as well as the many merchandise, medal and silver awards given in each class in the Aggregate.

The 25th Sharpshooter—W. W. Neubarth of Gridley was awarded a 1 year subscription to "Precision Shooting" as was the 15th Marksman—Marion O'Dea of Fairfield.

For a change the weather was kind and we had Calif. weather, Sunshine! This is the one time when 12 firing points is not adequate, as a record number of entries had to be returned for the lack of space. One shooter's reaction was "I've been shooting for a good number of years and this is the first time my entry has ever been returned." All told this was a very successful tournament and we hope that it will continue to be so.

Betty Landberg

LETTERS

222 MAG/6 MM IS A HUNTING GUN

Dear Phil:

The main reason for this letter (and ain't I argumentive) is that long-winded Ernest Stuhlschuter, whose letters to you I like to read, has a statement in the January Precision Shooting that has to do with the little Walker 6m/m (222 Mag. case necked up to 6 m/m). Who in hell says it's not a sporting rifle? This one I have sure don't know that. It has banged considerable game. Wait until next fall and one more head will be an elk. But deer and antelope its' fine for. Course it wasn't made for Elmer Keith's so called raking shots, but I don't shoot that way.

Mike Walker made me up a new rifle last year and I used it last fall. It's a 6 m/m Walker on the new 700 series Remington action with a 19½ inch barrel that does 1 inch groups for me fine with the 75 gr. Sierra bullet. For hunting, and that's what I use it for, I use the 85 gr. Nosler and at 2900 FPS, what in H is wrong with that. I have another little gun that I use the same bullet in and that's one I built years ago for the granddaughters. It was a 22 Hi-Power Savage. I had P. O. Ackley bore and chamber it to the 6 m/m/30-30 improved. Lenard Brownell hung a new Monte-Carlo stock on it. That's another fine little gun when used with the 85 gr. Nosler. The spool is so short in that gun that in order not to set the bullet back too far I use that bullet in place of the 100 gr. Sierra that I like for game so well in the 6's. In that gun I get some 3100 FPS with that bullet. Just means that I can shoot from a bit further away than with the little 6 m/m Walker—maybe 50 yards. But the Walker is tops up to 250 yards for us here. We have

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DANGEROUS HORNET HANDLOAD PRESSURES

The article in your last edition giving details of some work on the Hornet cartridge prompted me to look out some data on an accident I experienced in 1959 with some Hornet cartridges.

Shortly before I took up residence in the United States I purchased in England a fine single shot rifle by Holland & Holland. This was a box lock ejector rifle, with top lever, and automatic safety, and finished to the usual standards of Holland & Holland. Since it was chambered for an obsolete cartridge I had it relined to Hornet calibre by Parker-Hale in Birmingham, who, as you may know, do very fine conversion work in this calibre. The rifle passed English Nitro Proof without any trouble.

Because of the English law relating to firearms and ammunition I was unable to obtain ammunition for this rifle while I was in England. Hence at the time of my arrival in this country the rifle had never been fired other than to pass Proof.

For some reason I was unable to obtain shells for this rifle at several sporting goods dealers; their stocks being temporarily exhausted. Eventually another store produced two boxes of ammunition, one labelled Winchester Super-X (? if Super-X it must have had the Western name.—Ed.), the other REMINGTON-UMC. Both were old boxes, quite dusty, and because of this were sold at a reduced price. Examination of the cartridges revealed no abnormality.

On the occasion that these shells were fired the temperature was about minus 10° F—ie, very cold; there was a lot of snow about, and I was firing up a very narrow valley—offhand.

The first shot sounded very loud, as did the second. Both shots were 1 inch apart at 50 yds. The loud report was attributed to echo in the existing atmospheric and surrounding conditions.

The third shot (from the Winchester box—the other two were Remington) sounded louder still. Examination of the gun revealed no abnormality. The fourth shot blew out the primer, partially separated the barrel from standing breech, blew off extractor, separated case head, and sent fragments of brass in all directions. At this point I stopped shooting, and examined the shells.

Results of examination: The first two fired showed minute holes in each primer at the point of impact by the firing pin. Otherwise no abnormality.

The third case showed a crack one-half way around the case head at the point where the extractor was let into the barrel. The primer was pierced and loose.

The fourth case showed almost complete head separation, blown out pierced primer, and stretched case.

The gun was quite useless, the breech would not close, a 45 thous. feeler gauge (thickest I had) could be slid between standing breech and barrel face, the extractor was missing, and the rear lump bent.

My first assumption was that the rifle had excessive firing pin protrusion, causing pierced primers in the first two rounds, allowing gas to escape into the action, and gradually increased headspace by forcing the barrel away from the action by bending the lumps.

I therefore wrote Parker-Hale giving relevant details, and saying I thought the cause was excessive pin protrusion. At their request I sent unfired cartridges to the cartridge makers, whose ballistics tests are appended:

From Remington Arms Co., dated January 27, 1960

IN CALIFORNIA . . .

Tune up your deer rifle, your bench rest rifle, your target rifle and yourself at the

HUTTON RIFLE RANCH . . .

Official Range of GUNS and AMMO magazine
20 Covered Bench Rests with Spotting Scopes
Midway between Highway 101 and 101-A, in
Topanga Canyon, near Santa Monica, Calif.

MAINE GALLERY PISTOL TOURNAMENT

NRA REGISTERED

March 18, 1962 at Hampden Rifle & Pistol Club, Hampden, Maine
.22 Caliber 900 point Aggregate * Individual and Team.

Revere Silver and Blackington Medal Awards.
Programs from: M. F. Dunphy, 9 Bowdoin Place, Bangor, Maine

"We have now received a full report from our ballistic laboratory and technicians, of the results of their examination of the 7 loaded cal. 22 Hornet cartridges in Remington shells which you returned to us accompanied by your letter of December 12, 1959.

"First of all, we can very definitely state that all 7 of these cartridges were hand loads and not factory loaded. The primers and bullets and the propellant powder in these loads were all other than used in our factory loading, nor were they made by us.

"When the shells were gauged, they showed a variation of .0015" to .0095" over our maximum shell length specification. The primers not of our manufacture in these shells ran from .0035" to .008" over the Remington maximum height for seating and were in all instances above the head of the shell. We were unable to measure the head-to-shoulder length of these shells due to the fact that the bodies were swollen, which is not an uncommon condition in re-loaded shells.

"Two of these shells were pulled down and found to contain 13.55 grs. of powder which was so tightly compressed that it had to be picked at in order to be removed for weighing. Our nominal charge of powder of the type used in our factory loading is over 2 grs. lower than the powder charge found.

"Five of the returned rounds were tested for velocity and pressure. The results here were simply astounding, with pressures obtained that were some 22,000 lbs. per sq. in. above the maximum allowable pressure for this cartridge. The velocity of the cartridges was also some 250 ft. per second greater than the specification.

"As a result of our examination and test, you can readily see that the unfortunate experience you encountered was due to the obviously improper hand loading of the returned ammunition."

From Winchester-Western, dated February 16, 1960:

"— A report arrived at my desk from the factory on the Hornet cartridges which you had sent us for ballistic examination and it arrived while I was gone. I am pleased to pass on to you herewith the information which we received from our ballistics people on these cartridges.

"Our report verifies the report you received from Bridgeport. The average pressure of these cartridges was 67800 lbs. per square inch with a maximum average of 74600 lbs. per square inch! These are terrific and far beyond any normal pressure acceptable in the industry. As a matter of fact they run close to double ordinary pressures. Such ammunition certainly could

HUFNAIL BULLETS

Specializing in custom hand swaged bullets in calibers .22 through .30 that are not available from any other source, to the best of my knowledge. Write me about your needs and your particular bullet problems.

D. B. HUFNAIL
Town Line Road,
Rutland, Vermont

have been responsible for the gun damage sustained by your rifle." (End of letter quotes.)

Subsequent enquiries revealed that the cartridges had been traded in by a customer along with a bolt action Hornet rifle of Savage manufacture. The owner had always used his own reloads, but had neglected to inform the storekeeper that he was trading in handloads and not factory ammunition. The interesting point is that he had used the same load for years with no trouble.

The damaged rifle was subsequently repaired by Parker-Hale who fitted a new barrel-liner and extractor and bushed the lumps, so that once again it passed the Nitro Proof test. Needless to say the rifle is now performing perfectly.

This experience illustrates also the attitude of the ammunition companies concerned; there was doubt about their cartridges, and they went to considerable trouble to locate the cause of this accident.

I hope you will publish this letter as a small word of warning to those who think that overloading the Hornet cartridge is without any appreciable danger.

Dr. B. J. King
Rochester, Minn.

NEW REMINGTON 700 SERIES

We have just received the manufacturer's "news release" on the new Remington 700 series of center fire bolt action rifles which will replace the former models 721, 722 and 725.

Among features claimed for the Model 700 series are improved stocks and match rifle type trigger which is sharp and crisp with no play or creep. The 700 series is offered in two grades; the 700 ADL De Luxe and the 700 BDL Custom De Luxe. Both grades are chambered for 222 Rem. and 222 Rem. Magnum with 20" barrels and 6½ lb. weight; 243 Win., 270 Win., 280 Rem., 308 Win. and 30-06 with 20" barrels and 6¾ lb. weight; 264 Win. Mag. and 7 mm Rem. Mag. in 24" barrels and 7¼ lb. weight. The 264 Win Mag. and Rem. 7 mm Mag. have chrome plated bore.

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DEVCON "PLASTIC STEEL"

A Material for Bedding
by Capt. Rick Hornbeck

One of the most controversial subjects to grace these pages is the business of bedding action and barrel into wood. Let it be understood that I am by no means an authority on this subject. I would, however, like to pass on to those that are interested a method of bedding that has given excellent results to a number of shooters in the Mid-West.

The methods of bedding, the good practices that have been worked out by the fine stockmakers in the bench shooting game, who have given us their hard earned knowledge in these pages, should be used. The only new item introduced here is a bedding material known as "Plastic Steel," made and packaged by the Devcon Corporation of Danvers, Mass. It is primarily an industrial product. Missing is a release agent because the manufacturer had no idea that some darn fool gun-nut would use his product as a bedding material. The same release agents used for glass bedding are satisfactory.

There seems to be some doubt as to who is responsible for using Devcon for the first time as a bedding material. Records are seldom kept about such things. However, indications are that a gunsmith here in Wichita, Kansas, by the name of Tom Campbell suggested its use to one of our club members, Charlie Kunkle, who tried it and experienced excellent results. Henry Barton, a meticulous machinist and experimenter in his own right, went on to develop the use of Devcon and found it worked very well. He set a new National Match Course record in September 1957 with a gun bedded with Devcon, and this record stood until Bud Carden of Kansas City lowered the boom in 1960. To stick my neck way out, I will state that most of the guns in our local club at Wichita that perform the best are bedded with Devcon.

Because everyone likes to put forth their ideas, I will speak my piece, knowing full well that I'll get my ears pinned back. I have read every word I can find on the subject of bedding that has been written by professional stockers in these pages and elsewhere. I note that these gents advocate the bedding directly into the wood for the most desirable results. I feel sure that if I had the ability to fit barrel and action into wood in the meticulous manner that these gents do, I would be on their side of the fence on this subject, but I lack the experience and ability. Further, I note that it is generally agreed that a stock will, under some conditions, change over a period of time. I feel that some sort of bedding material in SUFFICIENT amounts is needed to have stable, CONTINUAL bedding. In other words, an ample amount of bedding around the action and barrel of a material that doesn't shrink while hardening or curing, and one that will maintain its shape regardless of changes in wood, temperature or humidity. I personally think that Devcon most closely fills these desires of any bedding material available at this time.

"Plastic Steel" is 80% steel, or so the manufacturer states. If directions are followed closely, it will not shrink during curing, which takes about two hours at 70° F. Most of us that use it advocate waiting 12 to 24 hours before removing the barrel and action. If more than the recommended hardening agent is used, there will be uneven shrinkage. An example of this was shown to me by Charlie Kunkle. Also, trying to get the material to harden faster with artificial heat will cause shrinkage. I found this out one chilly day. The material



Action bedding in stock with "Plastic Steel"

itself generates very little heat during curing compared with glass bedding. If directions which come with "Plastic Steel" are followed closely, there will be no trouble with shrinkage.

You will find any number of additional uses for Devcon. Around the shop it can be drilled, tapped, filed and shaped. It is excellent for stopping leaks in anything from the little woman's washer to the gas tank on the car. It perhaps sounds like I'm a stockholder in the company, but I'm not (darn it).

One big drawback, as the photo shows, is that Devcon is black and just doesn't match very well with any kind of wood currently used for stocks. However, a bit of care will hide it from sight. As for the gun in the photo, I wasn't worried very much about looks. I just wanted bedding.

The cost of the Devcon "Plastic Steel" runs about \$3.00 a pound, retail. It should not be confused with other products which Devcon makes. These are primarily adhesives found in your Hardware store.

After seeing what some of the local aircraft companies use "Plastic Steel" for in their shops, I have no worries about my bedding changing regardless of what Mother Nature wants to produce. They use it in their die shops for correcting boo-boos and to anchor down machines weighing several tons. Without exception to date, each rifle that I have used Devcon in has improved in performance. Continuous shooting, from .222 Rem. to my trusty old Springfield 30-06, has indicated that things stay constant. The only trouble with my rifles ability to shoot good groups is the clown behind the scope.

Because this bedding material is 80% steel, it would seem to me that the bedding is 80% more like the material in the barrel and action and therefore 80% more likely to stay the same as the heat of firing is passed from the barrel and action to the stock. This of course is theory on my part and as yet unproven. But results in match competition do indicate results. In a match this year, 9 of 11 awards were won by Wichita guns (all bedded with Devcon) in a field of 30 shooters. Incidentally, this was the only match in my life I took first place in and it didn't get published, so I will take this opportunity to blow my horn a bit. My wife shot in her first match and took small group at 100 yards. We now have two bench shooters in the family.

"Plastic Steel" is by no means the com-

plete answer to desirable bedding. But it does give exceptional results.

(Editor's note: Another seemingly similar product would be the "Plastic Meatl" manufactured by the A. L. Okun Company, 109E-02 Van Wyck Expwy., Jamaica, L. I. 20, N. Y.)

WHAT IS GOOD CARTRIDGE DESIGN?

The surest way to display ignorance of a subject is to start theorizing and that is just what I am about to do. Theory is the sum total of ideas developed by experience and tempered by general knowledge, whatever that might be. As with mathematics, one misunderstood or improper evaluation of an experience renders the sum total inaccurate. And it is the sum total that produces the theory. If somewhere along the line my interpretation or assumption is incorrect, I hope you will correct me.

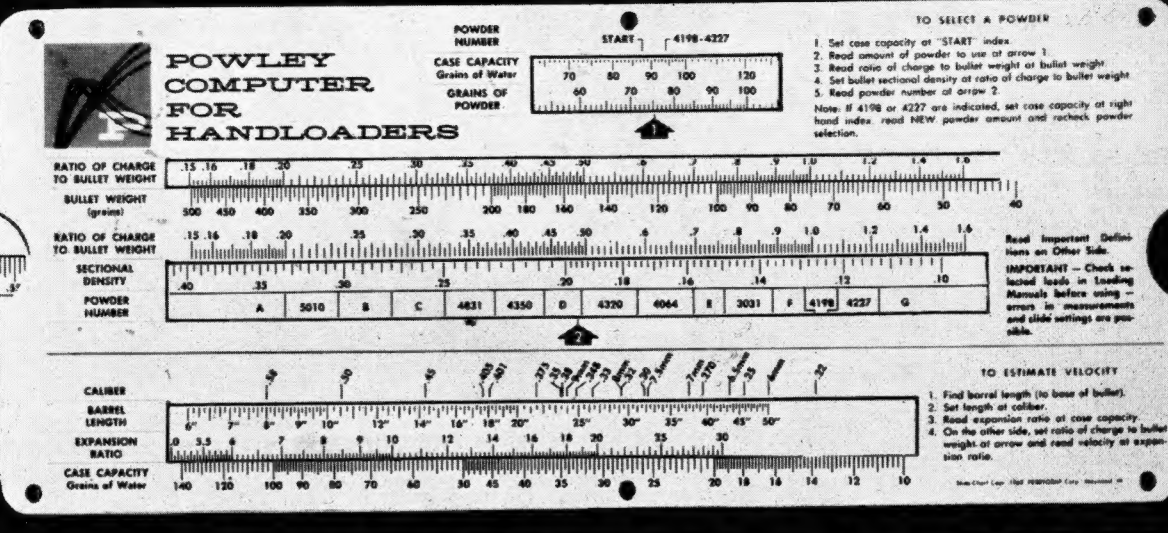
A cartridge is part of a general mechanism that is essentially a very simple form of internal combustion engine. That fact is important because there has been much research on combustion chambers and a tremendous volume of information is available to interested students. The principal difference between a cartridge gun and an ordinary working engine lies in the mass of rigid particles of solidified gas used to propel the bullet and in the use of the case as a gasket to seal in the gasses.

Now, if we can find a way to ignite the propellant at the base of the bullet instead of at the base of the case, many of our problems in cartridge design will disappear. With such ignition, reasonable differences in case length are less important than with conventional cartridges. In fact, if ignition could be initiated at the base of the bullet, a long narrow case would promote the progressive burning qualities of the powder. When so loaded and ignited, present day powders will produce higher velocities at lower pressures than is possible with methods now used.

When ammunition is ignited at the base, as with today's cartridges, much thought must be given to the shape of the chamber. That is, chamber shape must be thoroughly considered if improved efficiency is to be achieved. And I do believe that much ammunition used today can be vastly improved. Of course, compromises are sometimes necessary. That is particularly true when it is necessary to meet military requirements. For their purpose, case lengths and diameters must be limited in order to meet efficient feed and loading requirements and to achieve desirable rates of fire. A narrow cartridge can more easily be handled through a loading device and a short cartridge reduces the necessary movement of an automatic mechanism.

A long case is unsuitable for rear ignition because pressures are built up at the rear of the powder charge. Such pressure drives the powder grains against the base of the bullet and unnecessarily and uselessly elevates the pressure. The energy which that pressure imparts to the powder grains may readily be visualized by examining an open-base bullet that has been fired from a very short barrel. For this purpose I use a Springfield rifle with the barrel cut off so close to the receiver ring that part of the bullet protrudes from the muzzle when chambered. The flat base .30 caliber M2 military ball bullet is excellent for this purpose although any flat based bullet with an exposed lead base can be used. Fire it into an old ammunition box filled with rags and placed about five feet in front of the muzzle.

Now, if pressures are great enough to cause powder grains to imprint the base of



the bullet, we must assume that many grains are also driven into the barrel before they are consumed. They all try to get out of the chamber at the same time and, in their panic, they are jammed against the walls of the already overheated throat. Thus the grains promote erosion. When powder capacity is too great relative to bullet diameter and the resulting pressure of the grains against the throat is particularly heavy, we say the cartridge is over bore capacity. Gas alone will erode but abrasion by the grains that travel along with it accelerate the effect.

What can we do to alleviate the effects produced by our inefficient rear ignition? The answer, as I see it, is to shorten the case and make it wider or fatter. Such design shortens the distance that the early stages of ignition has to travel to the base of the bullet and it also sets up a back-wash of gasses along the sides of the case. Certain Diesel engine designs are calculated to promote this kind of combustion and it does appear to produce a more efficient power rating. Why should not the same thing work in small arms ammunition? Instead of driving the powder into the barrel, let us burn it in the chamber. The result should be higher velocities at lower pressures and, at the same time, less barrel erosion.

That brings us to the question of the most desirable shoulder angle. In my opinion, the most desirable angle is something approaching the shoulder of the .30/06 cartridge. Too great a slope, such as we have on the .300 H&H, promotes movement of the powder into the barrel. Too sharp a shoulder increases pressures unnecessarily without any compensating increase in velocity. The only time a sharp shoulder is useful is when less than capacity loads are used in a large case. Then, increased pressure promotes uniform combustion of the powder. Of course, my reference to sharp shoulders does not include such tiny ones as we see on the British .303 cartridge and on certain other large calibered sporting ammunition. Such small shoulders, whatever they might be, have little effect on internal combustion.

What cartridges do we have today that approach this short and fat design? The .250-3000 is a good example of an efficient cartridge. The .243 Winchester is another. Grain for grain of powder weight, the .218 Bee is more efficient than the .222 Remington and when the magnum equivalent of the .222 was lengthened without increasing the diameter (for manufacturing convenience) it became still more inefficient. I am not talking about accuracy. I am talking about

the efficiency of combustion and the power produced per grain of propellant. Certain motors also are known to run well although they are heavy consumers of fuel and tend to wear themselves out at an accelerated pace.

I recently purchased a Remington 40X in .300 H&H caliber. The rifle is all I want a rifle to be and sometime I'll write up my experiences with it. But I do not care for the caliber. I had to take it because it is the only magnum cartridge commercially available that can be used for long range target shooting. When loaded with present-day powders, I believe the .308 Norma or a necked down version of the .338 Winchester would be far better. In fact, from an all around ballistic point of view, the most efficient .30 caliber magnum design available today is the necked down .348 Winchester. If a cartridge approaching that diameter and with the same powder capacity could be turned out in rimless or belted form, I believe it would become one of our finest cartridges for long range work. Incidentally, Schultz and Larsen of Otterup, Denmark, will chamber their heavy match rifle for the .308 Norma Magnum. Such a rifle could give a good account of itself in the 1000 yard Wimbledon match at Perry. Maybe I'll be there, too, with my 40X.

The .300 H&H was not designed for American powders. But for use with Cordite it was admirably designed. When I first saw this cartridge as made by Holland and Holland it was loaded with Cordite. That was in the late 1920's. It had a large Berdan primer which directed the flash to the sides of the case and which instantly ignited the strings over their entire length. The gentle slope of the shoulder made the gasses immediately available to the base of the bullet and little, if any, powder was blown into the barrel. No such efficiency results from the use of American powders. Of course, Cordite is chemically more corrosive and erosive than American powders but the point I wish to make is that this type of loading produces less mechanical erosion and less artificial pressure buildup than that produced by loads assembled in this country. How much better it would have been if, instead of copying someone else, we had applied our own imagination and mechanical ability to design a magnum cartridge based upon the components at hand and which would use those components to the best advantage. What we did do resulted only in a makeshift product.

Fred W. Hallberg

POWLEY COMPUTER FOR HANDLOADERS

A 4 X 9 inches Slide Chart gives most efficient powder selection for guns using military rifle powders.

Selects best powder for any combination of bullet and cartridge case available in a matter of minutes. Powder charge for good loads is given at same time.

Powder Space is always nearly full for best uniformity of ignition and accuracy with highest velocity obtainable at good working pressures.

Within a few more minutes a good velocity estimate is made and can be checked closely against most Handbooks; if a wildcat, the forecast is excellent.

For powder selection the user has only to find the water weight in Powder Space and the weight of the bullet. The Computer gives the kind and charge of powder.

The computer will be marketed through shooting goods dealers.

P. S. After writing the above, Bob Sandager and I called on Leo Peterson, gunsmith at Judson, Minnesota, which is roughly a hundred miles down the road from where I live. Mr. Peterson had just chambered two .30-338 Winchester barrels for his son and another well-known competitive big bore shooter. While I was in his shop, he drew my attention to two boxes of empty cases lying on his work bench and which he was using in connection with a customer's job. The cases were Weatherby .378 belted magnums.

Here is something I would like to play with. When I was writing the above article, Weatherby cases were considered but I did not mention them because, in this part of the country, they are difficult to come by and they are very expensive. But, as I handled them, I decided here was something I could not let go.

As you know, the .378 case is considerably wider at the base than the so-called standard belted case. Mr. Peterson had determined that the .378 Weatherby had a capacity of 112 grains 4350 powder. Compare this with a capacity of about 75 grains 4350 of the .30-338 Winchester. Now what I would like to do, as soon as I can afford it, is to reduce the length of the .378 to a capacity of 75 grains 4350 and neck it down to .30 caliber. That would really give me a short fat case and yet proportions relative to bullet diameter would not be too unlike the .22/250 Varminter. Results should at least be interesting. If

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Cartridge Design

(Continued from Page Five)

someone else beats me to it, I hope he will report in detail all facts concerning design and results obtained. If results are properly observed and analyzed, we might even make an advance in small arms ballistics.

MORE PRIMER EXPERIMENTS

By D. B. Hufnail

I recently completed another primer test using five different makes, one of which is obsolete. All velocities taken on a counter chronograph.

Rifle: Caliber .243 Win. Model 70 Featherweight, barrel 22 inches long and 1-10" twist.

Load: 40 grs. 3031 with my own 72 gr. open point bullet.

Case: W-W Super-X, resized full length for each firing.

Five loads were fired with each primer for average muzzle velocity and extreme variation for the five shots. The results were:

Win. #115 primer (obsolete)

Ave. MV 3367 fps

Ext. Var. 46 fps

Federal 210 (green compound)

Ave. MV 3378 fps

Ext. Var. 68 fps

Remington 9½

Ave. MV 3376 fps

Ext. Var. 114 fps

Cascade (regular)

Ave. MV 3351 fps

Ext. Var. 79 fps

Cascade (Magnum)

Ave. MV 3337 fps

Ext. Var. 56 fps

I then used a split neck case and fired one load with each of the five primers with the following result:

Win 115 M. V. 3436 fps

Fed. 210 M. V. 3257 fps

Rem. 9½ M. V. 3279 fps

CCI Reg. M. V. 3257 fps

CCI Mag. M. V. 3322 fps

Since the Win. 115 primer showed least variation I tried five shots using the same split neck case. These five shots gave an average M. V. of 3319 fps and an extreme variation of 44 fps.

Usually one sets out to PROVE something. I decided to try to disprove something.

In many interesting conversations around the benches, and bull sessions before and after matches, I have heard considerable about any sort of obstruction in the flash hole of a case being highly detrimental to accuracy. Some of 'em would be highly upset if they knew a gnats eyebrow were hanging over the flash hole.

Here is what I have found out M. V. wise and Ext. Var. wise.

So that none of the boys, who might read this, will have any fear of coming to Vermont, expecting at any moment of having a bolt or an action come whizzing through the windshield, with a bird like me around, these experiments were all fired EMPTY first and muzzle flash noted visually.

Using the same load as for the previous tests with Rem. 9½ primers, I fired the following:

#1 with no obstruction over flash hole

#2 .001" aluminum foil under primer

#3 .004" writing paper under primer

#4 .009" post card under primer

#5 .012" writing paper (3 sheets)

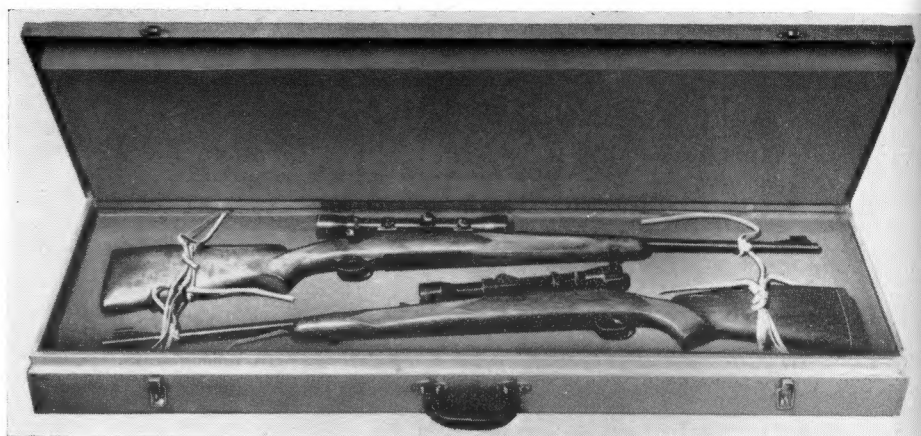
#6 .032" cardboard under primer

Ave. M. V. 3315 fps for #2 thru 6

Extreme variation 67 fps.

.032 inch cardboard is about as thick as can be used as the primer will not seat deep enough to allow closing the action.

The 25 shots, using five different primers, had Ave. M. V. of 3361 fps with Ext. Var. of 125 fps. So, we get 46 fps



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The Higgins aluminum gun case provides protection in shipping and in the field. Lightweight and compact, it is easily handled in back-of-the-car use, while it significantly lowers long-distance shipping costs.

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The standard 2-gun case measures 50" x 13" x 3¾" and weighs 16 lbs. Custom cases for individual guns, extra-large guns, etc. are available on special order. The Higgins gun cases are sold only through the manufacturer, Higgins Gun Cases, Dept. R1, Box 5941, Dallas 22, Texas. A descriptive brochure is available.

less AVERAGE M. V. with covered flash hole and 58 fps on the good side re Ext. Var.

Inclement weather has prevented any actual accuracy tests (will get to that later) but in view of the above I can see no reason, at the present time, why accuracy would suffer from an obstructed flash hole, unless, of course, it were of a material that was non-inflammable and even then I firmly believe it would have to be completely covered. It appears that a split neck can cause as much, if not more, variation in M. V. than does a covered flash hole.

One thing of interest that was noted was that with the aluminum foil, post card and cardboard the primer flame drilled the neatest little round hole, exactly the size of the flash hole, so that when it was removed the primer pocket was absolutely clean and bright. With the paper, a substantial amount of it was consumed. Regarding this there did come from this ex-

MV 3367 fps.

MV 3300 fps.

MV 3300 fps.

MV 3311 fps.

MV 3300 fps.

MV 3367 fps.

periment one thing that I am POSITIVE about. It is definitely the hard way to keep primer pockets clean as it is a bit of a fussy job, to cut these .210" covers so they will fill the primer pocket completely.

MUSIC OR NOISE

by Ted Smith

I once had a friend who was a rather good musician. He played the sax in a small orchestra. I asked him if it did not make him nervous playing in front of people and he replied that it didn't. He reasoned that ninety percent of the people couldn't play a sax and that half of the ten percent who could, couldn't play any better than he could. He didn't mind the criticism of the ones that were left. This line of reasoning might be good but it doesn't allow for the fact that a lot of people who might not be able to play could and would recognize the difference between music and noise. I know there are a lot of readers who can't write but I fear that they can recognize noise.

The fact that you readers know this, and fear to be heard because of it, keeps a lot of you from sending in good dope which is not noise and which many readers would like to know about.

A paper such as this has one very bad feature in this respect and that is that since it is a paper for the bench rest trade the readers take it for granted that everything they know is common knowledge and they hate to write in the details because they feel that everyone will say they already knew that.

I would like to make note here that I cat, sleep and drink shooting from morning to night. I take it to bed with me and I get up with it in the morning. I always have at least fourteen or fifteen rifles around and I have my own private, electric heated, shooting house with loading bench, chronograph and bench where I can shoot up to a hundred yards. With all this I look forward to the Precision Shooting each month and when it comes I go through it word by word like a beagle on a scent, soaking up every bit of information I can find. I expect, and I find some "noise," but no one will ever say they read P. S. from cover to cover in fifteen minutes. Stop thinking that everyone who reads this paper is an expert and write in your experiences—boy, it's music to my ears.

I don't know if it's music or noise but here's my dimes' worth for today. I read Precision Shooting and I read a lot of other bits on shooting and sooner or later each month I read an article where the author says that something "doesn't matter." Here a fellow says he never weighs his powder and fires a perfect group every time. Another never checks his primer pockets. Read on and there's no use trimming your cases. Some will say there's no use weighing bullets, or cases, and another will say mix up your cases, any old brand fires the same. The fact is that if you read far enough you'll find by adding the opinions of these experts together that nothing makes any

difference. Reloading and shooting is a process of elimination. Each detail can and does account for a certain percentage of the error. Eliminate all the errors and you come up with the Ultimate. Naturally we can't do this because we haven't advanced to the state where we can recognize all the possibilities, but we can eliminate the obvious ones. Why, I once knew a fellow who eliminated everything down to his own heart beat. Eventually he even eliminated that. Now he's a dead shot. Even you may reach that goal if you just follow my advice.

EXPERIMENTS AND EXPERIENCES

By A. H. Angerman

EFFECT OF POWDER MOISTURE ON IMPACT

Smokeless powder absorbs moisture when it is exposed to damp, humid air, and loses it when the air is hot and dry. If powder is very dry, energy that would normally have been used to vaporize the water now causes higher burning temperature and are, and therefore higher pressure. Conversely, if the powder has more moisture in it than normal, this extra water absorbs energy in evaporating, causing lower burning temperature and rate, and therefore lower pressure. Thus with precision bench rest rifles at least, we ought to see a distinct effect of powder moisture on the vertical point of impact, (vertical stringing) since variations in pressure will cause corresponding variations in velocity.

Accordingly I took a fresh can of 4198 and divided it into three parts. One third was dried in an oven at 230° F. for an hour, one third was left as is, and one third was moistened uniformly with water. The three parts analysed 0.14%, 0.92%, and 2.42% moisture. In loading twenty rounds of each for my .222 magnum bench rifle, I varied the weight of the charges such that each round had the same amount of powder, ie, I compensated for the moisture. The twelve five-shot groups were fired from 100 yards within a period of two hours under fairly quiet conditions. All bullets were from the same lot and all were weighed.

% Moisture in powder	Total charge
0.14	22.47gr
0.92	22.65
2.42	23.00

Moisture had no effect on the size of the groups; they all ran from 0.25 to 0.28" and all of them came in directly below the x ring with no horizontal shifting around. Notice that one could get considerable vertical stringing if the powder used for a group varied much in moisture. Had I mixed up the loads with 0.14 and 2.42% moisture, the groups would have strung out vertically by over a half inch. There is no assurance that the moisture in an opened, half-used can of powder is the same as that in a sealed fresh can. And what is the moisture content of powder left for hours in a measure compared to that poured in on top of it from a closed can?

FLASH HOLE UNIFORMITY

All flash holes in the cases I use are made uniform with respect to diameter via the use of a number drill of proper size. The holes are not always uniform all the way through the web, there being either torn out or burred edges on the inside, these being caused by their being punched rather than drilled. I've shot many groups using the same bullets and loads comparing cases with non-uniform versus uniform flash holes and never found any significant differences in precision.

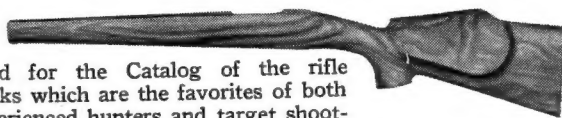
MUTILATED BULLET POINTS

Last summer I deliberately mashed the tips of some good bullets shut with a pliers

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to see if such mutilation had any effect on precision. The groups were terrible—twice as big as normal. It seems like good bullets have to be absolutely perfect in geometrical form.

EXTRUSION OF LEAD DURING CORE SEATING

While making my last batch of bullets, I ended up with about a dozen of them set aside that had stuck to the punch, and which on examination showed definite signs of lead extrusion. I swaged the points, and shot two five-shot groups at 100 yards. One measured 0.250", the other 0.185". I'm not trying to say that extrusion of lead around the seating punch is OK—maybe I was just lucky and had uniform extrusion. In any event two groups don't prove a damn thing anyway.

POWDER POSITION IN CASE

Much has been written on the importance of keeping loaded rounds in the same position, either point up, or point down, so that powder position and hence ignition will be the same from shot to shot. I proved the value of this to my own satisfaction by loading up a bunch of rounds for the .222 magnum with 23 gr. of 4198, shooting some with the powder tapped forward, some tapped to the rear and some mixed up. Groups were twice as big when the powder position was not held constant, and there was a 0.7" upward change in vertical impact in moving the powder charge from front to rear. I got the best results with the powder forward, ie. loads stored and moved to the chamber of the rifle point down.

WATER FILLED OGIVES

This was a crazy experiment to see if filling up the air space in the bullet ogives

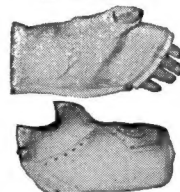
Weight of powder	Weight of moisture	Average impact below point of aim
22.44gr	.03gr	0.20"
22.44	.21	0.45
22.44	.56	0.73

with water would do anything for the advancement of precision! Getting the water in was easy. All I did was boil the bullets in water for a few minutes, cool them just below boiling, boil them again for a minute or two and finally cool them under water to room temperature. I prevented later evaporation of the water in the ogive by closing over the bullet tip with a tiny bit of vaseline. These bullets gave a most miserable performance. Five-shot groups at 100 yards ran from 0.511 to 0.551", while similar bullets not subjected to the water treatment gave a half dozen groups that averaged 0.266".

JACKETS

Did you ever have the opportunity to look at the surface of a copper bullet jacket with a microscope at say 100 to 250x magnification? Believe me a jacket has the roughest surface "terrain" you ever saw, full of pits, scratches, hills, valleys, scores, galls and bruises. It's amazing how well bullets shoot considering the surface roughness of the jackets. Perhaps the bullet rides down the barrel on only a relatively small number of projecting "high points" along the jacket, thus minimizing gross variations in friction from shot to shot. The pink, red, blue, purple or silver discolorations on the surface of so-called annealed jackets are due to extremely thin layers of

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copper oxide. I have never been able to prove that jackets annealed for ten minutes at around 450° F. made better bullets. I doubt if copper is really annealed much at this temperature so that if there is an improvement, it may be due to the thin oxide layer acting as a lubricant. (All this is pure, unadulterated conjecture.)

Precision bench rest bullets are made preferably from jackets with uniform wall thickness. The only way to get them is to hand pick out the good ones with a wall thickness micrometer or dial gauge gadget of one kind or another. There is no easier way to do it, unless of course the entire lot is uniform—a highly unlikely situation. Paul Gottschall has been trying to make a super precision rig to make the walls uni-

(Continued on Page Eight)

Experiments and Experiences

(Continued from Page Seven)

form in thickness, but so far reports "one damn frustration after another." Selection by weight or length doesn't assure uniform walls. Variation in the weight of an old lot of Kampen jackets was due to variation in wall thickness. Measurements on ten jackets of each weight gave:

Weight	Ave. Wall Thickness
11.4 gr	.0100"
11.6	.0103
11.8	.0107
12.0	.0110

CORES

In making up a batch of cores recently, the B&A die as usual proceeded to give nice, uniform weight slugs once it was adjusted properly. Nevertheless, I'd put a core on the scales every now and then just to be sure all was well. After about two hundred cores were swaged, their weight dropped abruptly by over a tenth of a grain. All three bleed holes were OK, the die was tight, the cores looked good, the tool leverage system was OK, the punch was OK, and there was no change in the allowed bleed time etc, etc. Cores came out as uniform as before but at a distinctly lower weight. After much probing and inspecting, I finally found the culprit, a thin, flat, sheetlike "plating" of lead sticking firmly to the face of the ejection plunger! When this was removed the core weights returned to their original figure.

Incidentally, pure lead is pretty soft and cores are dented easily. A core dropped onto another from a distance of only a few inches will cause denting or bruising. Dumping a batch of cores from one container to another, rolling them violently or other form of manhandling will in some measure ruin the original smooth finish. It is doubtful if these imperfections are swaged out during the core seating operation. I treat my finished cores like they were freshly laid eggs!

Finally while on the subject of cores and core seating I don't see how one can possibly get the same core seating pressure from bullet to bullet unless all the jacket walls are of the same thickness. The seating die and punch adjustment fixes the outside diameter and therefore the total internal volume. A thick walled jacket will leave less room for the core, and when the punch comes up the core gets a hefty push with perhaps even a little extrusion of lead if the punch size isn't quite right. Conversely a thin walled jacket will take up a smaller amount of the total space, leaving more room for the core with the result that it will get less seating pressure from the punch.

BULLET WEIGHT

Suppose we're making 52.0 grain bullets, some from 14.6 gr. jackets and 37.4 gr. cores, while another batch is made from 15.0 gr. jackets and 37.0 gr. cores. Both varieties would weigh 52.0 gr. Would they shoot into the same hole? I don't know. One argument might be that it wouldn't matter so long as the weight was the same, the centers of gravity are different which might alter the trajectories slightly.

EFFECT OF TEMPERATURE ON SCOPE SETTING

Next to the last time I shot my rifle, the temperature outdoors was 75° F., and the focus and parallax settings were perfect. The last time I shot it this season, the temperature was 28° F., a 47° drop. Focus and parallax were way out, and I had to move the objective lens by five divisions to restore clarity. This effect was due to contraction of the scope tube, and changes in the density and refractive index of the lenses. Conversely I suppose an adjust-

ment of the objective in the opposite direction would have been necessary had the temperature change been upward rather than downward. I never noticed the effect of temperature on a scope so definitely before.

RECOIL DISTANCE OF BENCH REST RIFLES

The formula printed on page 92 of the October, 1961 AMERICAN RIFLEMAN permits calculation of the approximate total distance a rifle has recoiled just as the bullet is leaving the muzzle.

For various bench rifles with 28" barrels we get the following figures:

Cal.	Wt. of rifle
.222	15lbs.
.222	25
.222	35
.222M	15lbs.
.222M	25
.222M	35
.219D	15lbs.
.219D	25
.219D	35

These recoil figures don't seem like much at first glance. As such they have no real significance. It's the variation in vertical and horizontal movement of the gun during this tiny bit of recoil that counts at the target.

RIFLE WEIGHT

It's debatable if a heavy (50 to 60 lb.) bench rifle is any more precise than one that weighs only 20 lbs. If the extra weight is in the barrel and action then there may be an advantage because of the extra stiffness. A heavy gun recoils less as illustrated above, for whatever this is worth. If all the extra weight is in the stock then who knows what value this is in terms of precision.

If you have a lightweight rifle now (20 to 25 lbs.) and you want to beef it up in weight, there are plenty of ways to do it. For example, drill a big hole into the end of the stock and fill it full of lead! Attach a 1" thick lead buttplate! Screw 4" width channel iron of appropriate length to the underside of the forearm, or fasten big blocks of lead to the barrel and to the buttstock like Sam Clark did back in 1955. I'm really not serious. Personally I don't think that unrestricted bench rest rifles should be made any heavier than a man can carry by himself from the firing line at Johnstown, back up through the birch and apple trees to the outhouse at the top of the hill without puffing!

BULLET PERFORMANCE

By Leslie Bowman

(Editor's foreword: The following information was contained in a copy of a letter that Les Bowman wrote to Harvey Donaldson early in January this year. It was not originally intended for publication but Les has given us permission to publish any information from his letters that we feel should be passed along for the benefit of others, and we think the following meets that requirement.)

For those who do not already know of him, Les Bowman operates a guide and outfitter service from his ranch headquarters in the vicinity of Cody, Wyoming. He has the opportunity to observe the killing of more game and the performance of both rifles and hunters in that killing every year than most of us do in a lifetime of hunting.

Les is also an enthusiastic and inquisitive minded rifleman who has his own range close to his house, with closed firing point equipped with bench rest, two chronographs and loading equipment, where he carries on extensive load development, experimenting and testing. His opinions and conclusions are based on a greater and wider first-hand experience than many of us

have an opportunity for.)

The prompting for this letter is that in rereading the old copies of Precision Shooting that I have and do frequently, I notice the piece by you (Harvey Donaldson) on TREE SHOOTING, as you call it. I have noticed remarks by others in the magazine from time to time that are in a similar vein. And as I can answer that, I'll do so now if you don't mind.

If you had a chronograph and would reduce your hand loading to equal the factory loaded stuff that went through the tree

Wt. of powder	Wt. of bullet	Recoil
21gr.	50gr.	.016"
21	50	.010"
21	50	.007"
23gr.	51gr.	.017"
23	51	.010"
23	51	.007"
27gr.	52gr.	.018"
27	52	.011"
27	52	.008"

you would find that it would do it now, too. You are just getting more immediate expansion in the higher velocity than in the old one. And as you know, you could force a pencil size and shape ounce of steel through the tree easier than the same weight in dishpan shape.

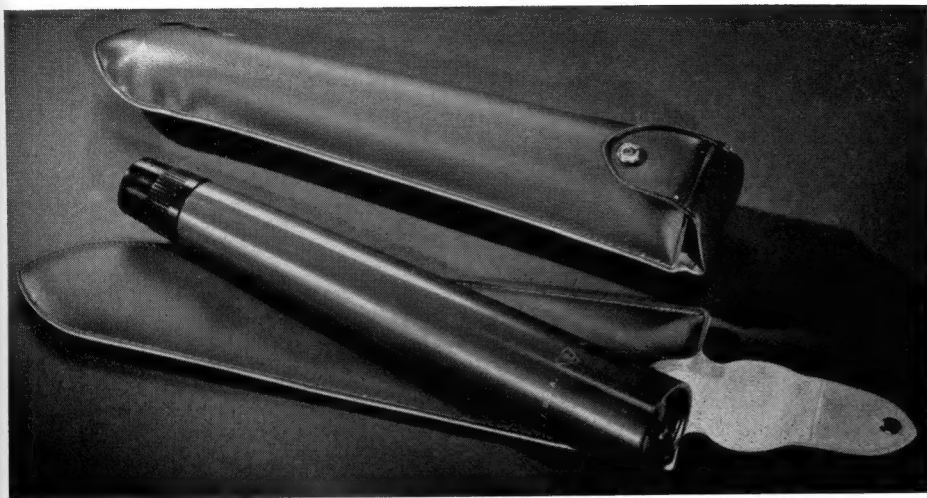
Many people (even Elmer Keith) in their writings express amazement that some pistol loads will sometimes penetrate further than a rifle. That is common in the game business but penetration is not the killing factor—it is **shock**, and the higher velocity with the greater expansion gives more shock. One does not KNOCK game down with any rifle regardless of the size unless it's a mouse or such. You SHOCK it down. There is very little comparative FORCE even in a magnum bullet at high speed. There is energy but there is a vast difference between ENERGY and FORCE or a better word, MOMENTUM.

On two saw horses for a bullet stop 2 feet to the rear of the second chronograph tape I have and use a block of dry cotton wood. Keep them sawed for that. One lasts me a year or two—it's amazing how long. I shoot into them with everything from 22's to 458's, and some 250-300 times in every one before changing. The blocks are relatively light—maybe 15 lbs. They never move and just set there, are not fastened down. Now if the damn rifles would KNOCK an elk of 1200 lbs. down then they sure as hell would knock that block off there. They don't hardly jiggle it.

With the .300 Weatherby rifle (I have and use one a lot) it startles some people to find that the bullet penetrated less in an animal at a given yardage than one from an '06. But inspection would show that the expansion of the Weatherby was far the greater and so was the shock and resultant killing power.

If you want to get good killing power from a slow speed bullet you must have diameter and weight. But if you want smaller caliber size then you must have velocity. So, the high speed bullet must be the best constructed of the two. The bullets as today made by the large manufacturers like Winchester and Remington and those like Sierra, Hornady, Speer and Nosler are really fine pieces of engineering and the product of much testing under actual hunting conditions. The choice of bullets for game in the modern rifle should be made with care. We pay more attention to the bullet here than to the caliber. Of course the proper placing of the bullet by the shooter is the number one thing in good kills.

There is such a thing as too much ex-



Bausch & Lomb's "Balscope Ten" telescope

pansion and that turns into bullets disintegrating and that is worse than useless for good game kills. If one could get it in a bullet, the ideal would be for it to be made so as to start expanding at impact and then, regardless of the caliber of the case used, go on through with only enough force left to drop on the ground on the other side. That would impart all the ENERGY and force in the animal. The energy that bullets that go on through with high velocity left impart on the hillside on the other side has no part in game kills. But as that can't be, then the maker of the bullet tries to get good expansion in the animal and have the bullet hang together to retain deep penetration possibly going on through. The great shock kills.

No one could possibly be more interested in seeing game killed cleanly and surely than we here in the business. We bring out about 150 head of game a year for our hunters and so see lots of examples of good and poor killing; both the results of bullet placement and of bullet function. As a result we are not too concerned of what caliber the hunter's gun is but how well he can place his shots. And with experts or novices, the flatter the gun shoots the better his overall accuracy with it, everything considered. We hate to see people come over-gunned to the point of flinching, which many do. We have more game wounded and lost with the real heavy caliber users than with the medium to light.

I have been hunting myself for over 50 years. I have taken considerable game myself of most all types. And there is just no substitute for placing the bullet in the right spot, no matter what the gun used. I have some 50 fine rifles here, most all custom stocked and scope sighted and in all calibers that you see today, I guess. And by choice I choose the medium calibers for game. If the stocking fits me I am not too sensitive to such as the .300 Weatherby but even the 30/30 in a poor stock bothers me.

I fire some 7000 to 8000 rounds of loads a year here over my range, in all calibers, and I am not too proud to do or adopt anything reasonable to cut down recoil all possible. Then too, although I'm hard of hearing as can be, I find that the noise is very much of a contributing factor in flinching, especially when shooting is done from the rest or the bench. In the field, under the excitement of the hunt, the shooter does not notice it so much.

I have and we used a 358 Norma this last fall a lot. It is a relatively light rifle made for me on a Springfield action by Al Biesen. It has one of Al's muzzle brakes on it and is a pleasure to shoot. The stock is a fine one and fits the average guy. We use Sigma ear plugs when shooting under

THE BALSCOPE TEN

The Balscope Ten is a new 10X telescope for general observation purposes now being produced by BAUSCH & LOMB. In this writer's opinion it is a remarkably fine little scope for general observation at a very modest cost (\$9.95 retail).

The Balscope Ten is conveniently small (10¼ inches long) and light (9 ounces) and with the neat little vinyl carrying holster available (at 98¢) it can be carried on the belt, readily available for use on any field trip.

Checking and comparing with my 10X scope sights, it is evident that the 10X means a full 10 power magnification. The field of view, so far as I can judge, seems to be at least equal to that of the better scope sights of similar objective lens diameter (1½").

Focusing is done by turning the eyepiece and sharp focusing is obtained from less than 25 feet out to infinity. Less than one full turn of the eyepiece covers the full range of focusing.

As with any scope or binocular of over 6X, it is necessary to rest the little scope against some solid object for most satisfactory viewing. I personally find that I get no more "dancing" of the object viewed when the scope is not rested than I do when using a 10X scope in the offhand position (and that sure isn't very steady) and that sitting and resting elbows or forearms on knees permits quite satisfactory viewing.

While the little Balscope Ten is not intended for a target shooters spotting scope, I would suspect that when fastened to a shooting box cover, or held in some simple rest that could be clamped to a bench, it might pinch-hit as a spotter for the target handgun shooter with a very limited equipment budget.

One possible disadvantage, or inconvenience, for some people is that the full field of view cannot be obtained when wearing eyeglasses, but that is also true when using many binoculars costing several times what the little Balscope Ten does.

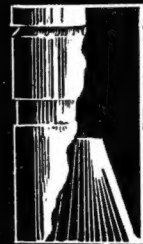
From the limited use and testing done to date, it is this writer's honest opinion that the B&L Balscope Ten is the best value available today in a modest cost optical instrument for general purpose observation use.

P. H. T.

the shed roof on the range but no one I have had use it in the field noticed the noise there. No one fired it more than once last fall at any one animal, so the hits with it were good. We used the 250 grain Norma bullet and my hand loads. Animals from BIG Grizzly and moose down were taken.

norma

.38 special match wadcutter



A SUPREMELY ACCURATE MATCH BULLET!

Strong statement but we mean it. You won't find another bullet . . . anywhere . . . that compares with this one for match accuracy! Here are four reasons why the Norma .38 Sp. Match Wadcutter can make the V-ring your second home:

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National Bench Rest Shooters Association, Inc.

NBRSA OFFICERS AND DIRECTORS FOR 1962

EASTERN REGION

Robert W. Hart (President)
300 West Fourth St.
Nescopeck, Pa.
Paul O. Gottschall (Deputy)
R. D. 4
Saleni, Ohio
Brunon Boroszewski (Deputy)
Chestnut Ridge Rd.
Orchard Park, New York

MID-CONTINENT REGION

Larry Engelbrecht
122 Gow
Wichita 3, Kansas

MISSISSIPPI VALLEY REGION

Alfred W. Walter
1925 Raft Dr., Hanley Hills
St. Louis 33, Missouri

GULF COAST REGION

Robert W. Smith
6806 Lake Shore Drive
Dallas 14, Texas

NORTH CENTRAL REGION

Walt C. Siewert
Box 749
Custer, South Dakota

NORTHWEST REGION

Dr. Rod Janson
606 West Galer
Seattle 99, Washington

SOUTHWEST REGION

John B. Sweany
187-A Silverado Trail
Calistoga, California

Secretary-Treasurer

Bernice E. McMullen
603 West Line St.
Minerva, Ohio

NBRSA MEMBERSHIP DUES:

Individual annual dues \$5.00 (includes magazine subscription for membership term). Associate member (wife or husband, son or daughter under 18 years of age, of member in good standing—no magazine) \$2.50. Life membership, \$75.00. Annual club affiliation fee \$10.00.

PRESIDENT'S CORNER

The course of fire for our National Championship Match has been decided by vote. It would seem that a great number of our members were undecided or very agreeable. The total number of votes received was 33, of which 22 voted for 200 shots for record and 11 voted for 100 shots for record. (Three votes were received on Jan. 4th but were post-marked in Dec. so they were counted.) Our National course of fire at the National Championship Match for unrestricted rifles will be 200 record shots. Program to be a duplicate of the 1961 championship matches.

The annual meeting of the Eastern Region was held on January 13th and 14th. (A separate report will be in this issue.) Every Director who possibly can should call an annual meeting of the Region members at the beginning of each season. The benefits that are derived from such a meeting are of great value to the members, the Region and the National Organization. It is an opportunity for members to express their desires, program matches, and for the Director to find out just what is best for his Region.

Precision Shooting magazine was represented at the meeting by their President and Vice-President. Ways and means of increasing our membership were discussed and we were assured that P. S. will lend all assistance possible. The Eastern Region plans to do some advertising and a commit-

tee was appointed for the promotion of membership.

I want to thank the writers of letters that are being received almost every day. I wish that I could answer every one that is received but time does not permit me to do so. These letters are from every region and are a credit to our organization. They contain a serious analysis of our situation and suggestions that show equal consideration of both sides of the question. This is good sportsmanship. I am pleased with the help that I am receiving by these letters.

The Eastern Region awarded the National Championship Matches for Varmint and Sporter Rifles to the Council Cup Range at Wapwallopen, Pa. This is my range and I plan to show appreciation of this confidence by doing everything possible to make it a most successful shoot. The match will be fired August 10th, 11th and 12th and we extend an invitation and welcome to everyone.

Until March,

Bob Hart

NEW VARMINT RIFLE RECORDS

NBRSA Record Certificates have been issued to Jerry Arnold, Gillett, Pa. for two Heavy Varmint Rifle class aggregates: A 100 yard aggregate (five 5-shot matches at 100 yards) of .2924 and a NMC aggregate (five 5-shot matches at each 100 and 200 yards) of .3539 minute-of-angle. These break Ross Sherman's .3003 aggregate for 100 yards and Ed Shilen's .3689 NMC aggregate.

In making the new records, Arnold shot a 26" Hart barrel in .222 caliber on Shilen action (a SHILEN RIFLES built gun). Total weight of rifle 13½ lbs. with Unertl 20X scope. His load was 21 grs. 4198 back of 52 gr. bullets made in B&A dies, and Remington primers.

Jerry Arnold shot these record aggregates on the range of the South Creek Rod & Gun Club at Fassett, Pa. (of which Jerry is secretary) on September 24, 1961. He had real competition at that match. Ray Wilson from Elmira, N. Y. fired a 100 yard aggregate for which the targets were also submitted for official record judging. Wilson's officially measured aggregate was only .002 inch larger than Arnold's.

FROM THE OFFICE OF N. B. R. S. A. INC.

Since L. R. "Bob" Wallack chose 1961 to so fluently write an obituary for the NBRSA, I think it only fitting that some facts and figures be printed directly from the records of the 1961 competitive season.

In his first article Mr. Wallack stated that he would analyze the sickness of bench-rest shooting, and went on to say that he believed that its mission was accomplished. If this were true, how does he account for the fact that the existing records were broken eleven times in 1961? Records were also established in the light varmint and sporter classes. True, bench-rest's mission was to improve arms and ammunition, but did this aim state that we were to stop at any given time? There are those who are still trying to shoot one-hole groups smaller than have ever been fired, and there are those who will keep trying until some day all ten shots will be in one bullet hole. Why anyone who has had a world record would say that it is all over, I can't imagine. His record set in 1948 was .531 inch for a five shot group at 200 yards, today that record is .2383 inch, and there is plenty of reason to think that it will be much smaller

in the future; why hasn't Mr. Wallack stuck around to try to do that little chore? His arguments against arms and ammunition are in direct contradiction to the basic mission as stated earlier. I can well remember several years ago, when I was just getting into the bench-rest game there was a certain "clique" who had better equipment and through experience had more "know-how" than the "little guys," and were very pleased when those "little guys" plunked their money down and let the "clique" take it home with them. This same "clique" had among its members some who had their benches reserved one year in advance. Since the inauguration of drawing for benches, where are the members of this "clique" now?

Mr. Wallack states that they used to have bull sessions at bench-rest matches. How can he possibly know that these sessions are not still in existence, having attended two shoots in two years? He claims to think that bench-rest shooting can be saved from the death he has written for it, but, how does he think things are done; by sitting home writing obituaries on something about which he so evidently has no up-to-date information on. We have bench-rest members, bench-rest shooters and bench-rest competitors; we need all three, but it is the bench-rest competitors who will do more for the NBRSA than anything else. By your attendance at matches and your effort to beat the other fellow, we will prove to Mr. Wallack and all the other propagandists that bench-rest shooting is very much alive.

Enough of this, let's get down to some facts. During the 1961 season there were 83 registered matches with 1604 registered competitors. There were nine new clubs added to the roster in 1961 and five of them were active during the season. At the Nationals this year the aggregates composing the "Top Twenty" were closer than in any previous year. True, this year the Championship was won on a mechanical rest, for the first time. In second place was a sand-bagger and in third place was a fifteen year old lad shooting from sand bags. I think the true bench-rest competitor will come out to the matches and shoot against anything any one wants to put on the bench, short of a vise.

If I have stepped on toes, I make no apologies, because I am only stating my own convictions and I happen to think every one has a right to do that.

Bernice McMullen
Sec'y-Treas., N. B. R. S. A.

GILBERT G. EMERSON

NBRSA member Gilbert G. Emerson died very suddenly on January 1, 1962 at his home in Upper Montclair, New Jersey. He had been in excellent health, had spent the evening with friends at a dinner party and was stricken while preparing to go to bed.

Mr. Emerson was formerly an aeronautical design engineer but retired from active work in that line following World War II. He was a veteran of World War II and retired from inactive duty as Naval Commander in 1953. In recent years he had been absorbed in hobbies of small arms ballistics and building model steam engines. He was an enthusiastic benchrest shooter and a member of the Pine Tree Rifle Club in Johnstown, N. Y., as well as many other shooting organizations.

1962 BENCH REST MATCHES EASTERN REGION

UNRESTRICTED RIFLES

Augusta, Ohio: April 14-15; June 30-July 1; July 28 (night); August 18-19; September 15-16. Reed's Run Rifle Range, P. O. Box 66, Augusta, Ohio.
Wapwallopen, Pa.: May 26-27; July 21-22. Council Cup Rifle Range, Robert W. Hart, 332 Montgomery St., Nescopeck, Pa.
Easton, Ohio: June 16-17 (State Championship). Chippewa Rifle Club, Nelson Berger, Sec'y, R. D. 1, Box 192, Marshallville, Ohio.
Southboro, Mass.: June 17; August 5; October 14. Southboro Rod & Gun Club, J. W. Baldwin, P. O. Box 402, Westboro, Mass.
Plainfield, N. H.: June 3 and Sept. 16; Plainfield Rifle Club, Leslie Stone, Sec'y, Plainfield, N. H.
Lewistown, Pa.: July 7-8. East End Blue Rock & Sportsmen's Club, P. J. Aurand, Milroy, Pa.
Johnstown, N. Y.: September 1-2; Eastern Region Championship. Pine Tree Rifle Club, Edward J. Sweeney, 501 N. Market St., Johnstown, N. Y.

VARMINT & SPORTER RIFLES

Augusta, Ohio: May 5-6; Reed's Run Rifle Range, P. O. Box 66, Augusta, Ohio.
Fassett, Pa.: May 13; June 9-10 (Pa. State Championship); July 4; July 29. South Creek Rod & Gun Club, Gerald Arnold, Sec'y, R. D. #2, Gillett, Pa.
Dryden, N. Y.: May 20; June 23-24 (N. Y. State Championship); September 23. Dryden Fish & Game Club, Edward Shilen, Dryden, N. Y.
Easton, Ohio: July 14-15 (Eastern Region Championship). Chippewa Rifle Club, Nelson Berger, Sec'y, R. D. 1, Box 192, Marshallville, Ohio.
Wanwallopen, Pa.: August 10-11-12 NATIONAL CHAMPIONSHIPS. Council Cup Rifle Range, Robert W. Hart, 332 Montgomery St., Nescopeck, Pa.

NBRSA CLUB SECRETARIES TAKE SPECIAL NOTICE

Will the secretaries of all NBRSA clubs that plan to hold registered matches in 1962 please estimate your needs for registration cards, rule books and targets and send me your estimate at your earliest convenience. This will help to get the major portion of this work taken care of before the shooting season opens and will assure clubs of having necessary supplies on hand for their matches.

I would appreciate it very much if club secretaries would send all data (cards, fees, match reports, etc.) pertinent to any one shoot at one time and, so far as possible, in one piece of mail.

It would facilitate getting your report in Precision Shooting if each secretary would send a copy of match results and a short note on weather conditions and anything pertaining to a shoot directly to P. H. Teachout, editor of Precision Shooting.

Thanks to all of you for your cooperation with a greenhorn last season.

Bernice McMullen, NBRSA Sec'y
603 West Line Street
Minerva, Ohio

EASTERN REGION WINTER MEETING

The Winter Meeting of the Eastern Region, NBRSA, at Mark Twain Hotel in Elmira, New York, of January 13 and 14, 1962, was opened by Director Bob Hart at 9:45 A. M., Jan. 13th, with some 20 odd members in attendance.

After observing one minute of silence in memory of the members and friends of the NBRSA who passed away during the past year; Irven C. Brockway, Gilbert G. Emerson and Colonel Townsend Whelen; and the reading of the minutes of the 1961 meeting, Director Hart gave a summary of events from the 1961 shooting season.

Nine new clubs affiliated with the NBRSA in 1961 and five of these clubs were active during the year. A total of 83 registered matches were held in 1961 and there were 1604 registered competitors. Of

these figures, 28 of the matches were held in the Eastern Region and 804 of the competitors were from the Eastern Region.

The problem of errors in the statistical work and scoring of National Matches was discussed. Bob Hart offered the recommendation that the NBRSA hire and pay one statistician and one scorer to take charge of the registering, scoring and statistical work at National Matches and he further recommended that \$1.00 per competitor per day be taken from the entry fees to pay a portion of this expense. Bob Stinehour offered a motion that this meeting recommend to the NBRSA Directors that they should standardize and control the scoring and recording methods at all National Matches. The motion was voted on and passed.

In giving the Eastern Region Treasurer's report, Marion Reece reported that the Pine Tree Rifle Club of Johnstown, N. Y. had presented a bill for \$385.00 to cover the cost of material for building the stationary backers installed for the 1961 National Matches. It was voted to pay this bill.

The problem that clubs have with obtaining help required to run a shoot and the expenses involved were discussed. It was pointed out that with the club registration fees generally charged, a club would not make any money unless most of the help is donated. No recommendations were made regarding this matter.

Deputy Director Brunon Boroszewski announced that the Reed's Run Rifle Range in Ohio, the Dryden Fish and Game Club in New York and the Council Cup Range in Pennsylvania had all made bids for the 1962 National Varmint and Sporter Championship Match. Reed's Run and Dryden withdrew their bids in favor of the matches being held at the Council Cup Range at Wapwallopen, Pa. It was voted to award the match to the Council Cup Range and that the dates for the matches be August 10th, 11th and 12th, 1962.

A vote was then taken to find out if the shooters wanted the Varmint and Sporter Nationals to have the same shooting schedule as has been used in the last two years or to adopt a new shooting schedule that might enable more shooters to attend the shoot. Under the previous schedule a shooter was required to attend two days of the match in order to compete in any one class championship. A new schedule was proposed which would permit the shooting of the entire championship course (100 and 200 yard stages) in a single day—each of the three days being devoted to the firing of a championship course for one class. Eight voted for the former system and eleven voted for the new proposed system. For the 1962 shoot, each day will be devoted to firing the championship course for one class and awards for that class made as soon as results are available at the end of the day. Thus, a person who may be limited as to time may compete in one class championship in a single day attendance at the match, and those who wish to do so may compete in all three classes by attendance and firing on all three days.

Bob Hart awarded two world record certificates to Gerald Arnold; one for the 100 yard aggregate and one for the National Match Course aggregate in Heavy Varmint Rifle class.

Brunon Boroszewski announced the winner of his special \$100.00 prize for the best NMC aggregate fired with a .30 cal. rifle in 1961. George Kelby Rittman, Ohio, was the winner with a .529 MOA aggregate. Brunon also announced that he would provide another \$100.00 prize to the person firing the smallest National Match

Course aggregate with a .30 cal. rifle in a NBRSA registered match during 1962.

Boroszewski also awarded the Charles Hart Memorial Team Trophy to the winning team in 1961, L. S. Rucker, C. A. Mauk and George McMullen whose combined aggregate average was .3945 MOA. Runner-up team was P. Gottschall, L. Shelt and Omar Rinehart with an aggregate average of .4052 MOA.

The subject of shooters using sand bags competing against shooters using precision rests was brought to the floor by Director Hart. Members were given the opportunity to express their opinions. Hart gave a report of the letters he has received from all regions of the NBRSA concerning this same subject. The general opinion was that the present rules should not be changed, but clarified, and that a weight limit be put on the open class rifles shot from sand bags because the difference is too great between the 20 to 35 lb. rifles normally shot from sand bags and the 50 to 80 lb. rifles shot from mechanical rests. A majority of twenty-one to two voted that future shoots in the Eastern Region be divided into two classes or the club holding the shoot must specify in their program which class is to be shot.

A committee composed of John Collins, Crawford Hollidge, Robert Stinehour and George Kelby was elected to nominate candidates for election as Director and deputy Directors for 1963 and 1964. This committee will set up a plan for the mailing of votes by those who will be unable to attend in person the election meetings.

Director Hart read a letter received from the Worlds Fair Committee asking the NBRSA to hold an International Bench Rest Match at the Worlds Fair in 1964 or 1965. Crawford Hollidge recommended that Charles Kingsly, Port Washington, N. Y., be appointed a liaison officer to investigate the possibilities for such a shoot and make a report to NBRSA. Unanimous opinion was that the publicity aspects of such a shoot would be tremendous.

Member Joe Stearns made a report on the research and progress he has made on water-proofing targets. He reported that he has found a solution to soak targets in to make them water-proof and during the coming season he will make tests to decide if the idea has merit or not.

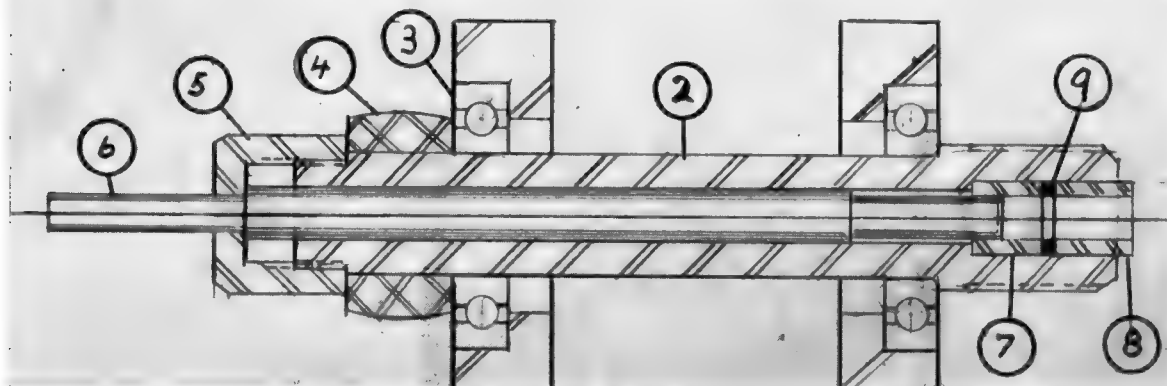
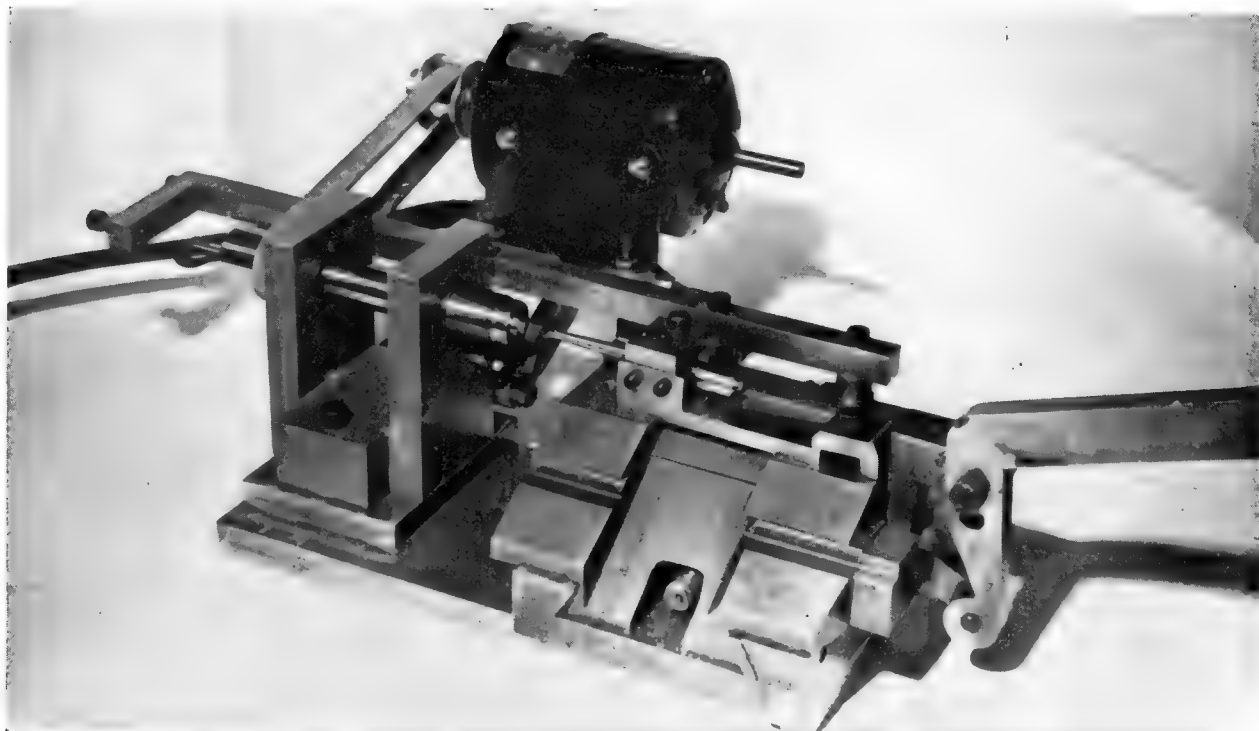
Crawford Hollidge announced that Precision Shooting magazine would donate one page of space to the NBRSA to be used for a questionnaire.

The general meeting adjourned at 4:00 P. M. but the Director, Deputy Directors and Club Representatives went into session to set up the 1962 schedule of match dates for the Eastern Region.

The Sunday session opened at 10:00 A. M. and the 1962 match schedule was presented for approval.

Clyde Hart asked the NBRSA to do some advertising in other shooting magazines. Bob Hart suggested that a committee should be appointed to work on the advertising problem. Crawford Hollidge suggested that a Deputy Director be elected or appointed to handle advertising and public relations. Hollidge's suggestion was adopted and he was elected to that position. It was voted that \$300.00 be appropriated for advertising and public relations. While the advertising is expected to be a benefit to the whole NBRSA, so far as membership increase may be had, the appropriation voted is from the Eastern Region treasury.

Final adjournment of the meetings was at 11:30 A. M.



MACHINING BULLET JACKET WALLS

By Paul O. Gottschall

At Johnstown during the National Bench Rest Matches I became very much aware that many of our top shooters were selecting their match bullets with an indicator gage (the jackets they made their match bullets in, that is) and Mr. L. E. Wilson was machining bullets for match shooting. When I got home I rigged up an indicator gage and quickly realized that this had some merit but was entirely too slow for Paul Gottschall. Mr. Wilson would have given me a description of his tooling if I had taken time but I got no opportunity so I missed out on that.

However, I could not get the idea off my mind. After kicking the idea around for several months I decided to see what I could do about machining the inside of the jacket walls, like I believed Mr. Wilson was doing.

I had a small slide rest off an old grinder that was about the size I figured would be required, and also several small motors. The problem, in my view, was how to chuck the jackets and what sort of a spindle would be best for the job. I reasoned if production turned out to be too slow I would be wasting my time altogether.

The accompanying sketch of the spindle and the photo should be of interest to anyone with a desire to try machining bullet jacket walls.

MATERIALS LEGEND

- Head Stock Weldment—cold rolled steel
 - (2) Tool steel, heat treated spindle— $\frac{3}{4}$ X 24 thread at nose end— $\frac{9}{16}$ X 24 thread at small end— $\frac{1}{4}$ " ream thru—.3750 Bore $\frac{3}{4}$ deep nose—.6250" outside diameter.
 - (3) 2—Barden Super Precision Bearings, Light-inch series R1055 Double Seal—.6250 bore—1.3750 O. D.—.3438" width.
 - (4) Aluminum pulley, 1 $\frac{1}{16}$ " dia., $\frac{1}{2}$ " wide.
 - (5) T. S. end cap— $\frac{9}{16}$ X 24 thread— $\frac{13}{16}$ O. D.
 - (6) $\frac{1}{4}$ " drill rod—depth stop and knockout rod.
 - (7) Hardened—honed and ground bushing.
 - (8) Hardened—honed and ground bushing.
 - (7 and 8 are to scale for length and honed to .2219 I. D. for the particular batch of hulls in process. O. D. ground to .3750" to light press fit in spindle.)
 - (9) Victor O Ring 72700 Series. Use #72704— $\frac{7}{32}$ X $\frac{11}{32}$ X $\frac{1}{16}$ for .224 jackets. This O ring arrangement will hold and drive hulls of .2215 to .2219. A second set of bushings honed to .2224 takes care of the larger ones.
- The cross hatched spindle and surrounding area is to true scale and should be reasonably self explanatory.
- The bearings and the O rings were obtained from BEARINGS, Inc. whom you may find in the phone directory in most large Eastern Cities.

It seemed that if I could drive the hulls by pushing them into a perfectly true running spindle, against a stop, I could bore them perfectly true with a small commercial boring tool, such as sold by the Bokum Tool Co., 14775 Wildmere, Detroit 21, Michigan. Their size OOB $\frac{3}{8}$ shank, standard length, high speed steel is about right and should cost about \$4.00 each.

The spindle and head stock in the sketch was made up and set up with the slide rest as you can see in the photo. The pulleys were made of aluminum on a 9" South Bend lathe. The belt is home-made of leather only $\frac{3}{64}$ " thick, lapped and ce-

mented into an endless belt that runs very smoothly. I began with a spindle speed of 1800 R. P. M. but soon found that it was very difficult to produce a nice smooth finish regardless of how carefully the tool was honed. Experiment led to another motor with 5000 R. P. M. and an equal 5000 R. P. M. spindle speed.

Then, after careful alignment of the head stock with the slide so as to copy the inside taper of the hulls, I began to get results. The slide is not doweled in place and is tapped into alignment with a plastic hammer, as I expect to play with wall thickness in the future.

The rod used for a depth stop was changed like the sketch and an arm attached to the slide to eject the jackets. At this stage I found that the individual jackets varied in diameter in any lot of 1000 jackets in the ratio of .2216 O. D. to .2219 O. D., not much but it seemed to rule out .0001 tolerance for concentricity.

Oddly enough, with the spindle bushing honed to .2219 a jacket of .2216 would usually drive and stay in place in the spindle, but once one did start to slip, nothing more could be done with that particular jacket.

In the course of conversation with friends at Elmira we became aware that the jacket could be expanding to fit the bushing by centrifugal force from high revolution. When I returned home I jacked the spindle speed up to 10,000 R. P. M. and I am quite sure this is so.

This, however, started extreme tool wear and was soon abandoned. At present the spindle speed is about 4000 R. P. M. and I have installed a small O ring between a two piece bushing which drives any jacket that can be inserted.

Should the front bushing move just a wee bit too easy, smear a speck of Elmers glue on it before you push it into the spindle. You can buy commercial bushings to these tolerances from manufacturers of drill and die insert bushings and all you should need to do would be to grind to length.

I have mounted a limit switch near the slide which starts the motor when the tool approaches the jacket and stops when the tool is withdrawn. The motor is 1/10 HP, 5000 R. P. M., 110 volt.

The jackets are inserted into the spindle, pushed home with my fingers of left hand—right hand on the lever works the slide in and out—motor stops—jacket is ejected—chips tapped out and another inserted at the rate of 5 jackets per minute, 250 per hour with ease. I check about once in 50 jackets. Jackets must be perfectly free of chips to get an honest check. Variation of .0001 to .0003 inch in wall thickness concentricity reading of a batch of hulls that previously had all those reading .0003 or less removed by selecting. Some of those bored had a wall thickness difference of .0013 inch before machining.

My opinion is that a jeweler's lathe could be adapted quite easily. The only point I have to make is that machining can be done quicker than selecting, and I know enough about the Benchrest breed to be sure most of you can do anything I can do.

THE BOROSZEWSKI \$100 B. R. AWARD

Dear Phil:

Just a line to let you know that George Kelby of Rittman, Ohio, won the \$100.00 .30 caliber award for 1961. His aggregate for the five 10-shot matches at 100 yds. was .507" and at 200 yds. was .551 MOA, for a grand aggregate of .529 MOA. This was fired at the Reed's Run Rifle Range, Augusta, Ohio, on August 19, 1961. I believe George was there using a .308 with 44 grs. of 4320, Western primers and 168 gr. Sierra bullets. George put this rifle together in the beginning of August to shoot for this award. He sure did—his nearest competitor ran a grand aggregate of .776 MOA. Incidentally, Kelby's grand aggregate average for three national match courses fired with this gun is .562 MOA—100 yds. was .556 and 200 yds. was .568. All were fired with the 168 gr. Sierra bullets. On my suggestion he used a 14" twist barrel. The gun weighed 27 lbs. and was always fired with a rear sandbag rest. Best of all—**newcomers take notice**—he spent **less than \$100.00** for the completed rifle, without scope.

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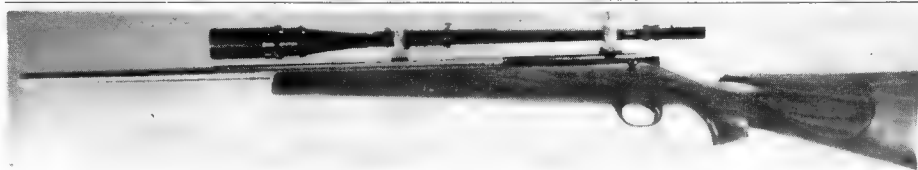
.22 rim fire blanks sold installed in customer's action only.

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LaFayette, New York, R. D. #2

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\$3.50 at your dealer

I am again offering the \$100.00 award to a competitor for the best unlimited rifle national match course aggregate fired in 1962 with any .30 caliber rifle in any one registered match under N. B. R. S. A. rules and sanction. Only seven men eligible completed such courses of fire in 1961. I hope there will be many more in 1962. To avoid mistakes and properly judge the winner in 1962, I am asking each competitor to keep his targets, as and when fired, to be submitted to me for decision, **if requested**. When the match is completed, please have each of the targets dated and witnessed by the range officer and official scorer at the match. Anyone competing **must mail to me his aggregate score** (NOT the targets) and details as to when and where fired in an envelope **postmarked no later than twenty days after the match was completed**. There is no limit on the number of scores you can post with me.

Sincerely yours,

Brunon V. Boroszewski
954 Fillmore Ave.,
Buffalo 11, New York

.30 CALIBER BENCHREST MATCH

In spite of cold and fog which kept some known prospects away and a rather short time for preparing guns for the match, four shooters fired the unrestricted rifle National Match Course with .30 cal. rifles on the Richmond, Calif., Rod & Gun Club range, December 30th.

Allen Hobbs, shooting a .308 in Hart 28" X 1 3/8" barrel on Shilen bench rest action with Lyman 20X scope weighing 38 lbs. and load of 43.6 grs. of H380, Sierra 168 gr. bullets and CCI Mag. primers, had a 200 yd. aggregate of .8204, a 100 yd. aggregate of .732 and a NMC aggregate of .7762 MOA.

George Fullmer, shooting a .308 in Hart 30" X 1 1/4" barrel on Springfield action with Unertl 20X scope, weighing 20 lbs., and load of 42 grs. H380, Sierra 168 gr. bullets and CCI Mag. primers, aggregate of .732 and a NMC aggregate of .7762 MOA.

(Continued on Page Fourteen)

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.30 Caliber Benchrest Match

(Continued from Page Thirteen)

gated 1.001 at 200 yds., 1.112 at 100 yds. and 1.065 for the NMC.

E. P. Hinkle, shooting a .30-06 in Pfeiffer 27" X 1 1/8" barrel on Springfield action with Unertl 20X scope, weighing 18 lbs., with load of 45 grs. 4320, Hornady 180 gr. bullets and CCI Mag. primers aggregated 1.541 at 200, 1.3243 at 100 and 1.392 for the NMC. L. Beckman disqualified at 200 yds.

WEBER HEAVY BENCHREST ACTION

Al Weber, Rt. 1, Box 154, Lodi, California, is now making a special heavy, large action for NBRSA "Unrestricted class" bench rest rifles. The action weighs 10 pounds, with receiver 2 inches in diameter and 14 1/2 inches long. Barrel thread is 1.210 inch in diameter and 1 5/8 inch long. Action may be had in extractor type with loading port, or in shell holder type bolt face and no loading port in receiver. Trigger guard is machined from bar stock with 5 socket head cap screws.

A CORRECTION

In the announcement of NEW BENCH REST RECORDS on page 10 of the December 1961 magazine, there is an error in the equipment and load data for the two aggregate records with Sporter class rifle made by Arthur J. Freund of St. Louis, Mo. His bullets were reported as 73 gr. (6m/m) made in B&A dies.

Mr. Freund advises us that he does not own a set of B&A (Biehler & Astles) bullet making dies. The 73 gr. weight for the bullets is correct but he made the bullets in his BAHLER DIE SHOP dies, made by Adrian Bahler, Coos Bay, Oregon.

PHT

NATIONAL CHAMPIONSHIP DATES

Just as we are closing this issue we have received word that the Tulsa Bench Rest Rifle Club has set the dates of September 27, 28, 29 and 30, 1962 (Thursday thru Sunday) for the NATIONAL BENCH REST CHAMPIONSHIP matches for unrestricted bench rest rifles.

P. H. T.

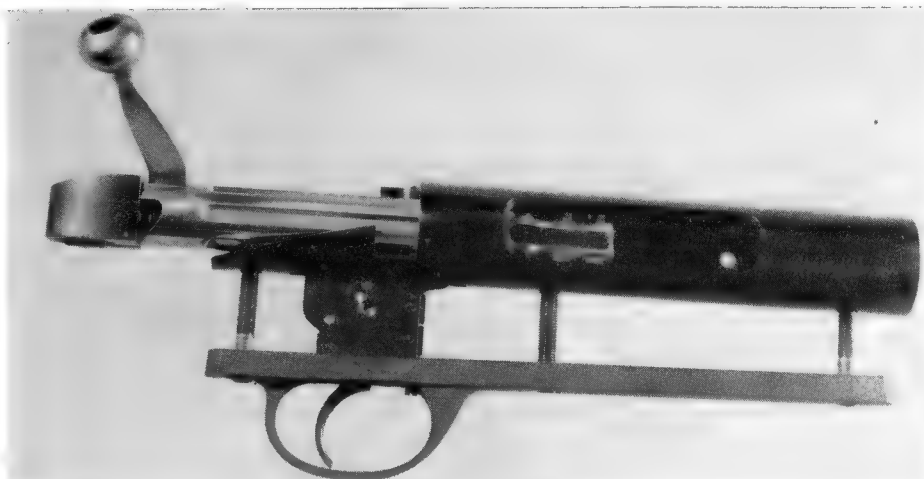
ANOTHER RECORD EQUIPMENT CORRECTION

Mr. H. B. Reagan, Big Spring, Texas, makes the following corrections regarding the rifle he used to make the 5-shots at 100 yards record group with Sporter rifle, as reported in our December issue (page 10). Dear Phil:

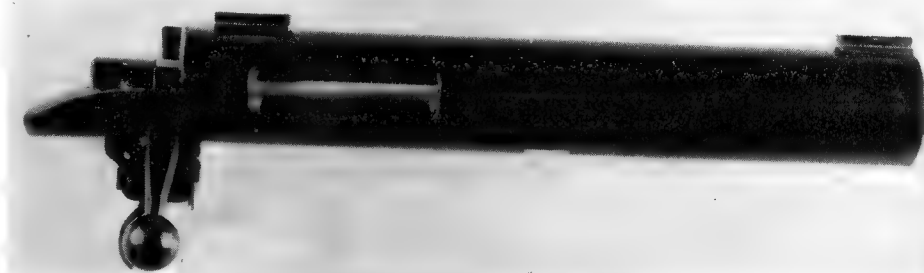
I expect I really ought to have my head examined. I wrote you some time back calling your attention to the fact that the stock on the sporter with which I shot my record group was a factory stock, and not one I made. I overlooked at the time that I should have corrected the action to a 40-X Remington in place of the 722 as reported.

The correct details are as follows: 40-X Remington action and barrel—I guess you should designate it as a 40-X barrel to be exact, in a factory sporter stock taken from a Rem. 722 rifle with barrel channel opened up. I had also "scratched" around the action bedding some but still don't have it the way it really should be. Caliber is 6m/m International-Walker version. I had to use the factory sporter stock from the 722 in order to make the weight limit, as the 40-X stock was too heavy.

The point that should be emphasized, in my opinion, is that I had a straight factory rifle in a combination that most anyone can duplicate from Remington's Iliion shop. It should certainly encourage more



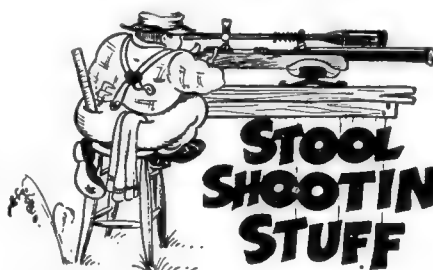
Shilen special heavy bench rest action.



New improved Shilen rifle action.

tyros to enter the game and I hope that it will

H. B. Reagan



Dear Phil:

The decision to hold the Elmira meeting several weeks earlier paid off as far as weather was concerned and for once I have seen sunshine in Elmira on Sunday afternoon as Merrie, Bill Purcell and I started homeward bound. The three days covering the trip were beautiful and I felt badly for the Ohio fellows who were faced with an unexciting and tiring nine hour train ride home.

The forecast didn't seem too bad and we who attended were a little disappointed that more shooters didn't show up. The Hotel was rather generous to us and gave us a nice big hall for our meeting, so big as a matter of fact that we seemed to rattle around in it.

The agenda went off pretty smoothly and by the middle of the first afternoon, we had chewed over and come to pretty general agreement on a number of points. Some of them, of course, will only be recommendations of rather a general nature to the Directors and it must not be considered that the things which affect the entire NBRSA are final until acted upon by those Directors.

The page allocated for use of the NBRSA by this magazine will undoubtedly make official announcements but I, for one, came away from the Elmira meeting with the distinct feeling that we who attended

SHILEN RIFLE ACTIONS

Illustrated are present rifle actions made by SHILEN RIFLES, Dryden, New York.

At top is the current standard model, which includes Remington 40X trigger and trigger guard unit. The action may be had with the Remington 2 oz. trigger or the Canjar trigger on special order. The Standard model is made for cartridges of .308 Winchester length or shorter. Note the fluted bolt, which takes 2 ounces off the weight and makes a smoother working bolt.

A Magnum model is available, which is exactly like the Standard model except that it is one half inch longer to handle cartridges of .30-06 or 300 H&H Magnum length.

Below is the special Bench Rest action with receiver 2 inches in diameter, over-all length of 16 inches with barrel thread 2 inches long and weighing 8 pounds. This action uses the same bolt as the Standard and is available with the same triggers as the standard model.

had taken some prudent steps towards a brighter future.

Bob Hart had on hand a series of letters from shooters all over the country who had taken the time and effort to outline and forward to him their ideas on some of our problems and their conception of ways that might help to solve them if they were adopted. Bob did not read these letters, I think partly because of his very characteristic practice of not attempting to bias the thinking of those present. He did indicate that thoughts were along certain lines where there were sufficient letters recommending similar solutions. Almost a solid majority of those present voted for the change in the names of the two heavy class rifles, separate handling of those two classes on the part of the match sponsors, and the ceiling limit of rifle weight for the sandbag class. Some opinions were expressed on changes that might be advantageous for the varmint class rifles but so far as I know, there were no definite recommendations on

the part of those present even though the varmint shooters were well represented.

A new Director and two Deputies must be selected for the Eastern Region and voted upon on or **before** the Johnstown match. Please notice the word "before" because it indicates a much needed change in policy whereby every member of our Region may express a preference for leadership. A committee was chosen to recommend a choice of names for those positions; however, write-in space shall be available in each instance for those who have a preference different from the names listed. These ballots will be mailed in and added to the votes taken at the forthcoming Johnstown meeting, in September. The candidates chosen by the nominating committee will be published early enough in the season so that careful consideration can be given well prior to the time of voting.

A great deal of interest occurred when Bob Hart read a letter from officials of the 1964-65 Worlds Fair to be held in New York. This letter invited our organization to explore the possibilities of benchrest shooting in conjunction with the Fair. It is a very intriguing thought and might well be the greatest breakthrough that benchrest shooting has ever had. Just imagine the millions of people who would see and hear of benchrest shooting for perhaps the first time as they viewed a match in person or over their television sets. Many details are ahead of us which must be worked out and if we are going to win that match against worldwide competition, some pretty serious practicing must take place and a few real hot guns had better be stockpiled.

You notice that I mentioned above "world-wide" competition. Indeed, we are well on to that threshold and there is evidence on hand that organizations are forming in England, Canada and other foreign lands. I hear from these fellows from time to time and carry on some pleasant correspondence with them.

Perhaps these contacts and bits of correspondence contributed to the selection of Crawford Hollidge to a newly created post in the Eastern Region NBRSA. It is that of Deputy Director for Public Relations and he'll have to add to his daily chores some more letters and efforts along the line he has long worked at. A modest budget was voted for use in advertising and other methods of publicity which will benefit the entire national organization and perhaps such a position should be considered from the national level, in later years.

It looks like we are going to have a very interesting summer schedule in our Eastern region, and doubtless other areas will be busy, too. The interest in varmint rifles and matches for them is constantly growing and as we learn to make them more accurate, custom makers and Remington Arms are learning to build more accuracy into their products. It is interesting to see that almost without exception, these guns now being produced are entirely practical for field use. Perhaps they are a little heavy if one is to do a lot of walking or climbing but make no mistake about it, the rifle that features a reasonable weight will be more accurate in any type of shooting. Weightlessness has its place and it might be a very interesting experience for some of us, but I have tried light rifles often enough to know that they aren't conducive to the ultimate in accuracy.

The National Varmint rifle matches are to be held at the Council Cup range this year over August 10th, 11th and 12th, and the fine new facilities there will entice many hot varmint shooters. If things go as planned, there will be a separate day allocated for each type of rifle in the varmint classes

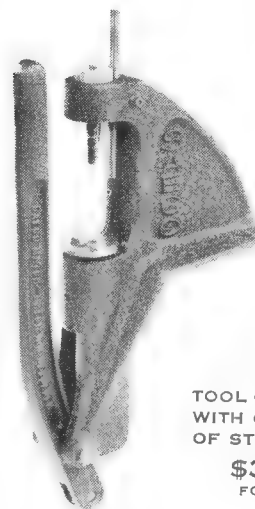
and from the one occasion I enjoyed shooting at that range, I expect the matches to be very pleasant and a good opportunity to shoot under normal conditions. By normal, I mean that moderate winds will probably prevail and good doping of those conditions as well as mirage will be required if one is to stay with the top men.

I wonder how many shooters are wearing the latest model of the NBSA patch in which we all take so much pride. We are going to endeavor to better publicize this patch and the shooters who are not wearing them on their latest and most frequently used shooting jackets should send to the National Secretary, Bernice McMullen, 603 W. Line St., Minerva, Ohio, \$1.25 for one of these attractive patches. We are all mighty proud of our organization and those patches are noted with a great deal of respect wherever they are worn. Of course, all members are entitled to wear them whether they take part in active benchrest competitions or not and an extra patch tacked up in your loading room or workshop will add to your prestige as well as be helpful to our organization.

We shall all miss Colonel Whelen but much of the spirit which he possessed is characteristic of a lot of shooters. He fortunately was able to put into writing many interesting facts and experiences. We all can't do that but we can in our little ways follow his example of always boosting the best in the shooting game, by listening to the other fellows viewpoint, by respecting his rights to his position, by continually recognizing that the right to bear and use firearms is a cherished heritage which must be guarded by a considerate and intelligent handling of them by all who use them. He early recognized that our guard could never be let down and we, too, must always be aware that there are groups of people who either maliciously or thoughtlessly would take away these rights by a series of misguided laws that would eventually weaken us to a point where even if we had the will to resist, we could not have the arms or the familiarity with their use which is so essential for national survival in view of world-wide conditions.

I enjoyed reading those few pointed notes that were printed in the last issue of the magazine under Roy Dunlap's by-line. He is the kind of a rugged individualist we like to hear from and I think some of his comments made a lot of sense. I could see the general soundness of his remarks about not sub-contracting the building of a new rifle but we have to face life as it is and some of the facts are that there are too few makers of rifles who are qualified to provide us with the wide range of ability necessary for delivering a finished product with which we can step directly into competition with reasonable hopes of coming out on top. We live in a world of a few specialists and many who would call themselves that; however, the benchrest shooters have demonstrated that they can separate the phony from the genuine and that is one of the reasons why our magazine enjoys a strong group of the nation's leading makers of fine products as a backlog for its advertising. By the advice which we individually give to fellow shooters, we help them separate the wheat from the chaff as they purchase new equipment or modify their old. As shooters of precise equipment ourselves, we should be and very generally are generous in the help which we give to others. Such an attitude was early present among our shooting group and it did much to accelerate our growth. We would be silly not to continue to give the best advice to new comers or to

(Continued on Page Sixteen)



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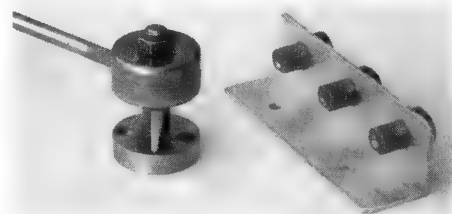
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Stool Shootin' Stuff

(Continued from Page Fifteen)

competitors who are having a hard time staying with the group.

I am heartily in favor of Roy's suggestion that we separate our development of classes of rifles into functional uses and where possible we should accent the human factor in the varmint and sporter classes. As far as I am concerned, Roy didn't need to retire to the storm cellar after his comments, and I for long have stated that improvement might be expected in our game if we encouraged the coincidence of the point of aim and the point of impact.

Your little editorial, Phil, on asking the manufacturers to accomplish the impractical and sometimes the well nigh impossible made sense. It was interesting to hear Mike Walker say, at the Elmira meeting, that we were asking the jacket manufacturers to deliver to us a \$10 order of jackets within plus or minus a few ten thousandths of uniformity and wall thickness, yet the manufacturer himself could not place a ten thousand dollar order for the rolled jacket material which could be guaranteed to be within the same limits of uniformity as we were asking for in a finished product that is as small and delicate as a bullet jacket. The small decimal fractions which are tossed around in conversation or in letters by those who have not the least conception of how small a measurement they are talking about has always amused me but I can see how the big manufacturers get worn out trying to impress common sense on people who can't use it. The demand, however, for the best that is available is a characteristic of the precision shooter and it will be a sad day when he loses this interest or fails to appreciate the efforts that are continually being made to give him what he asks for. This is where our magazine can

come to the front and if we will continue to sponsor the outstanding in efforts and in products, we shall continually justify the high regard which we so zealously have built up among our friends.

Cordially yours,

Crest Stuhli

Letters

(Continued from Page Two)

NEVER lost a head of game with either one. And how dead can dead be? There is nothing takes the place of (1) placing the bullet in the right spot and (2) using the right bullet for the job. All the big bores in the country won't kill 'em if you don't hit 'em. Both of the above rifles are LEGAL for big game here in Wyoming.

So the 6 m/m Walker or whatever it's called IS a sporting rifle. I have never had a nicer gun in my hands to shoot with than this little fellow. I'll pulverize the lungs on a deer and it goes on through with a good exit hole at 200 yards. I would not recommend it though if other than Noslers are used on game in less than 100 gr. weight and the 100 gr. are too long to load right.

I'm looking forward to the same caliber in the 40-X, lightened enough to make the sporter class and light varmint. Maybe I'll get one.

Re Dunlap's remarks on the similarity of a benchrest accuracy nut and a Weatherby fan is that they wear pants—where does he get that way? I sure am, and for the record, a Weatherby fan. Last fall 22% of the hunters we had used them, and well. We have yet to have one fail us. But at the same time I am or thought I was becoming a benchrest accuracy fan too. Maybe I had better drop it—but with the

money I have tied up in benchrest guns and equipment, I sure thought I was interested in it.

We used the new 700 series Remington rifles here last fall in hunting to the point we got 22 kills with them in 7 m/m Remington caliber, not to mention the deer-antelope kills with the little Walker 6 m/m. We loaned the big rifles to all the hunters we could who were here and everyone liked them. This is the first time I have ever seen factory stocks that were shaped for hunting that would satisfy the owner so well. Remington has certainly made a good step here. Of course Roy Weatherby has had a good shaped stock and that's one of the reasons his guns have sold as well as they have. Good stocks reduce "kick effect" and in heavy recoil rifles that's necessary.

Les Bowman
Cody, Wyoming

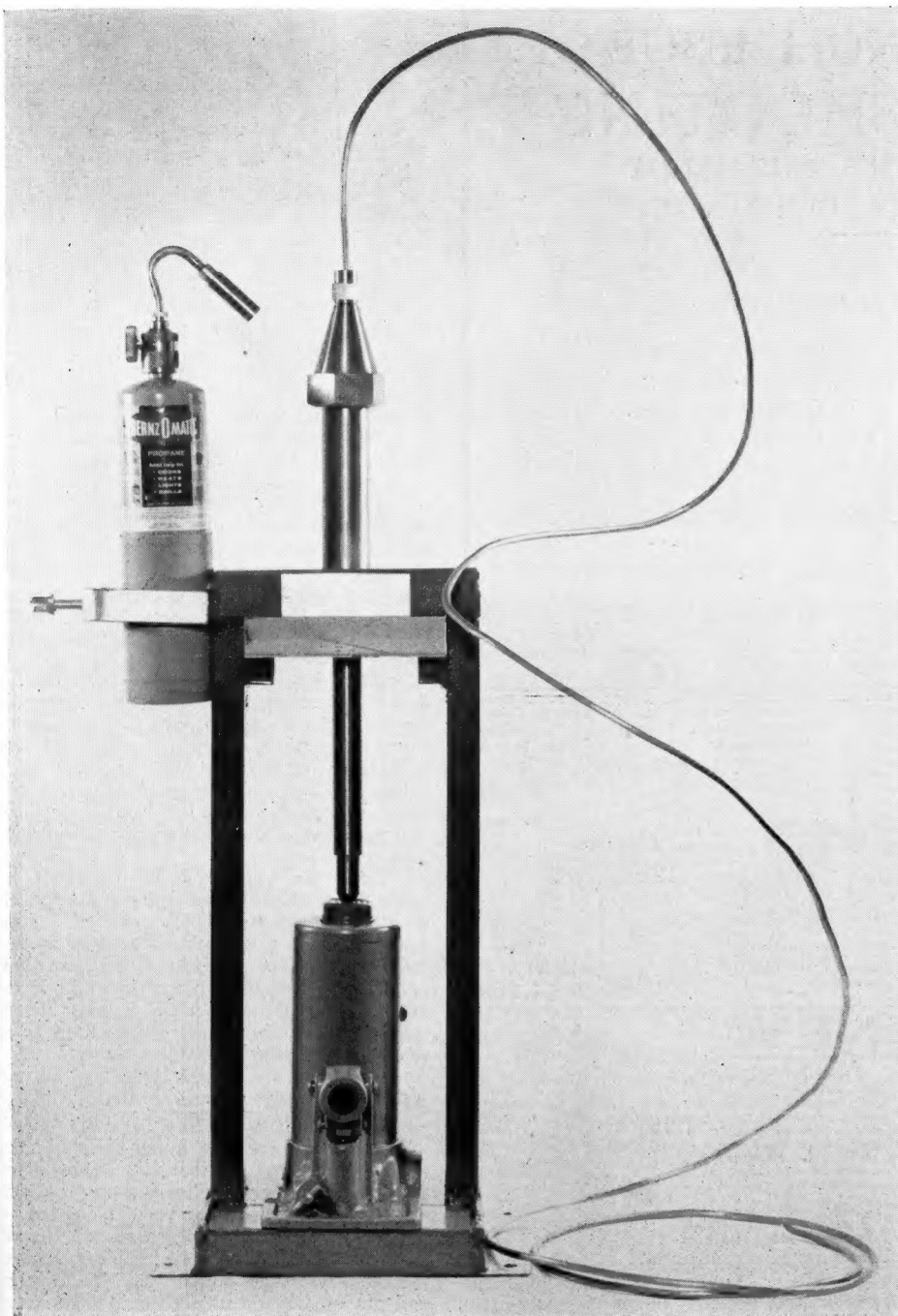
MORE ON BERDAN PRIMERS:

Dear Sir:

The article by Dr. B. J. King on the 303 British cartridge interested me as I have attempted reloading it. Some of the empties I used were made in Finland and used a 5.5m/m primer. I tried removing the primer by filling the shell with water and using a 5/16 rod as a piston I drove the primers out with partial success.

Some of the shells expanded under the treatment so that I had to resize the neck. I overcame this trouble by making a die out of Cerrobend, a low melting alloy. Just plug the end of the resized empty and pour the Cerrobend around the shell. I also use Cerrobend for chamber casts. I bought Cerrobend at a plumbing supply house.

I should like to hear of anyone that has reloaded the Swiss Schmidt-Rubin 7.5m/m
(Continued on Page Eighteen)



Multi-Core Lead Wire Extruder

MULTI-CORE LEAD WIRE EXTRUDER

The Multi-Core lead wire extruder for reloaders, manufactured by MORT'S MULTI MACHINE CO., Box 43, Alpena, Michigan, permits reloaders to make their lead wire for swaging bullets from locally available scrap lead.

The machine is powered by any 5 to 10 ton hydraulic jack and any small L. P. gas torch is used for a heating unit. The jack and torch are not included in the cost of the extruder, which is \$59.95 plus shipping cost. Quite comprehensive instructions for operation of the extruder are supplied with it.

Briefly, to make the wire the pure lead scrap is melted and impurities skimmed off. The nose cone (extruder die) is pre-heated with the gas torch, after which the molten lead is poured into the reservoir cylinder of the extruder, heat from the torch played on the cylinder just below the nose (forming) cone and pressure applied to the piston in the cylinder with the hydraulic jack. It is

stated that 10 to 12 foot lengths of wire are obtained from a cylinder full of lead, the length depending on the diameter of the wire extruded. Nose cones are provided for the different diameters of wire.

Since the wire sizes listed are for bullets of caliber .30 through .45, it would appear that the machine was intended for making wire of sizes for swaging handgun bullets. It would seem from reading the literature that making the small diameter wire required for swaging cores for the smaller caliber rifle bullets might be rather difficult with this machine; but that is just the impression one gets from the reading and may not be entirely true.

Considering cost of the equipment and labor of making the lead wire, it would not seem that this machine would offer very practical money saving advantage to the average individual reloader. It might well be a worthwhile investment for custom bullet makers or for clubs using large quantities of swaged handgun bullets.

P. H. T.

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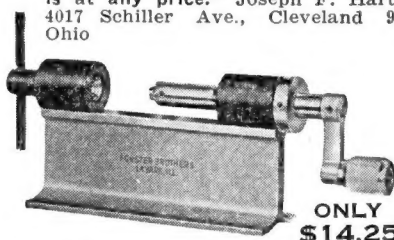
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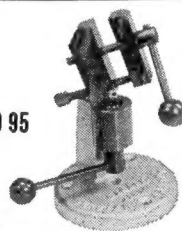
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New Remington 700 Series

(Continued from Page Three)

The model 700 BDL is also offered in 375 H&H Mag. and 458 Win. Mag. having 26" barrels with muzzle brake and weighing 9 lbs., and at a price which is relatively as big as the cartridges—\$310. Prices for the other calibers are competitive; the model 700 ADL starting at \$114.95 and the 700 BDL starting at \$139.95.

The new Remington cartridge for which the model 700 series will be chambered, the 7 mm Rem. Mag., has very impressive ballistics. It will be factory loaded in two bullet weights; 150 gr. and 175 gr. The advertised muzzle velocity for the 150 gr. bullet load is 3260 FPS and the muzzle energy 3540 PSI, and for the 175 gr. load 3020 FPS and 3540 PSI.

Apparently the 7 mm Rem. Mag. cartridge and the 700 series rifles have been quite fully "field tested" before being put on the market. Les Bowman in his "BULLET PERFORMANCE" article in this issue reports excellent performance for the 7 mm Mag. cartridge and has words of praise for the 700 Series rifles, especially for good fitting and comfortable stocks.

It is announced that shipment of the new 700 Series rifles to dealers will start about March 1st. It is probable that many

people will not find the new rifles available at their local dealers much before early Summer.

P. H. T.

More On Berdan Primers

(Continued from Page Sixteen)

1889 and 1911 cartridge. This 5.5mm primer fitted the few empties that I had but since then I was able to secure some Jap made empties with American primer pockets. Since the Swiss have done fairly well in international matches with this cartridge I think that it should become better known.

Edward Romney Milford, N. H.

HOT LEAD ANNEAL:

Gentlemen:

In a recent issue someone was inquiring about the Hot Lead Method of case anneal. Refer to November 1950 American Rifleman, page 41, by Al Barr.

Dip neck and shoulder only in Hot Lead for not over 4 or 5 seconds. If case becomes very warm back to solid head, time should be cut. The lead will not stick to the case as a general rule. Hope this will help whoever was inquiring.

George Gillette Bismarck, N. Dak.

DOESN'T GIVE 'EM A CHANCE:

Dear Sir:

You and your Staff are to be congrat-

ulated upon the fine magazine you publish. It contains more accurate information accidentally than all of the others do on purpose. May you continue to educate those of us interested in shooting.

In this area we have been unsuccessful so far in any type of formal benchrest shooting. Despite the fact that over 90% of the male population shoot a Mule Deer every fall, when they are approached to do a little shooting at a target to sight in a rifle, or attend a Turkey Shoot, their excuses run from "I don't want to have to clean my gun again" to "It's no fun to punch holes in a piece of paper, but show me some hair over that front sight and I never miss." Which is why a certain buck with over a 30" spread is still running around Pinion Mesa.

We were driving down an old sheep-wagon trail when this buck and several does were spotted across a canyon, about 300 yards away. This character jumped out of the pick-up, ran about 25 or 30 yards to a tree, and then stepped around it and leveled his old open sighted .32 Winchester '94. He stood on his hind feet and shot like a man at that big buck till his magazine was empty, and never came close to the deer.

After he had reloaded I had him lie down and shoot at a rock near where the deer had been, which was at least three times larger than a deer. It only took him 4 shots to finally hit it with his .32. Then I had him shoot at the same rock with my scope sighted '06 with my hand-loads. He had no trouble hitting the rock three times in a row.

After we were back in the truck, he said; "That outfit doesn't give a deer much of a chance, does it?" Since then I have wondered how many other would-be sportsmen have the same idea; that it is not quite cricket to be able to place a bullet in an animal where it will cause instant death, and eliminate the waste and suffering of wounded animals.

D. H. Gibson
Grand Junction, Colo.

GOOD LITTLE GUN:

... Obligated in a hurry-up fashion to work out of Portland last fall, I was reluctant to leave a good rifle in a car (railway express) that sometimes was obliged to be in Boston. Had a 219 Savage Hornet single-shot for which I had hand-loaded in the past. Yanked off the old 333 Weaver and put on an open sight, B'guess and B'God with the fingers and a tap of the hammer. After a five hour morning hunt one day up beyond Cornish, I asked the partner if he cared if I fired a check shot. At 70 yards it pinwheeled the letter "A" in a beer carton after announcing the shot and calling it. Well, he was amazed; I was pleased but not too surprised. That same Hornet has accounted for 12 deer that I know of—I have loaned it often.

M. F. Dunphy Bangor, Maine

A PRICE CORRECTION:

Dear Mr. Teachout:

I need to send you a correction in the price of Cities Service Solvent #26, which I have used for cleaning cartridge cases. I have just bought some more of it at the local distributor's warehouse here in Fayetteville and it cost me \$2.93 per gallon.

I checked back and found that it cost me \$11.54 for five gallons in 1953, so even then it was approximately \$2.31 per gallon. Therefore, my apologies are in order for sending you the false hopes of getting the stuff for one buck per gallon, as noted in my letter which you printed in the December issue of P. S.

Harmon L. Remmel
Fayetteville, Arkansas

TRADING POST

Classified type ads; no display. Rates: — 10¢ per word per insertion, prepaid. Minimum charge \$1.00. Closing date for ads is the last Saturday of the month preceding publication.

Groups of figures, abbreviations and initials count as words. Hyphenated word counts as two words. Name and address of advertiser is counted. Use full words instead of initials and abbreviations and make your meaning entirely clear — get your money's worth.

WANTED: PRODUCT. Reilly Machine Works, 445 Western Avenue, Albany, New York.

THE BENCH REST BAGS you read about. All top grain leather, no inner bags used or needed. Set #1 for ANY rifle, #2 for sporter or varmint rifles. #2 set needs no pedestal if front bag is blocked up. #1 \$6.50, #2 \$9.75 postpaid.

NOW a shoulder pad to sew on any thin shirt for comfortable shooting of your heavy rifle in summer. Leather faced NYLON padding $\frac{3}{8}$ " thick \$2.75, $\frac{5}{8}$ " thick \$2.95 postpaid. BASIL TULLER, Galeton, Pa.

HANDY-DANDY RELOADER: Available for following cartridges—222 Rem., (std or Mag), 22/250, 250/3000, 243 Win., 244 Rem., 6MM/HLS, 6MM/Int. (Walker's), 270, 308 and 30/06. Wildcats to special order. Work up a load where you shoot with precision bench rest quality ammo. Exclusive taper neck sizer and floating chamber straight line seater makes reloading fast, easy and accurate. Only \$16.95 post paid. CONSOLIDATE ARMSLUBE, P. O. Box 1238—209 13th St., Alamogordo, New Mexico.

BARREL FLUTING: Save $\frac{1}{2}$ to $1\frac{1}{4}$ pounds of weight by having that barrel fluted. Send barreled action or just barrel. Two week service, \$15.00 PPD. SHILEN RIFLES, Dryden, New York.

REDFIELD VARIABLE 3X-9X RIFLE SCOPE

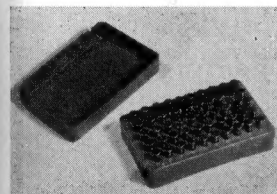
The 1962 catalog of the Redfield Gun-sight Co. announces a new Redfield Variable 3X to 9X rifle scope with a feature that shooters have been waiting for ever since variable power rifle scopes came into the shooting picture.

It is stated that the standard reticle crosshair covers $1\frac{1}{2}$ minute of angle on the target at 3X magnification and decreases in apparent size as the scope power is increased until at 9X the crosshair covers only $\frac{1}{2}$ minute of angle on the target. This feature should make a variable power rifle scope that can truly be considered all-purpose optical sighting equipment for hunting rifles.

The new variable has the good internal elevation and windage adjustments with the constantly centered reticle of other Bear Cub scopes. Besides the standard crosshair reticle there is available at extra cost a post with crosshair reticle with top of post covering 1.2 minute of angle at low power and 0.4 m.o.a. at high power, and dot covering 3 m.o.a. at low and 1 m.o.a. at high power setting.

All I know about the new scope is what I read in the catalog but it does seem that my big objection to vari-power scopes has been eliminated and that I'd better start saving my pennies (9950 of them) in order to buy one.

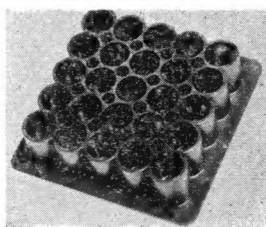
P. H. T.



Cartridge Box
.22 Lr. Cal.

NEW! "OSTER" Plastic Products

Loading Block
(Range Block)

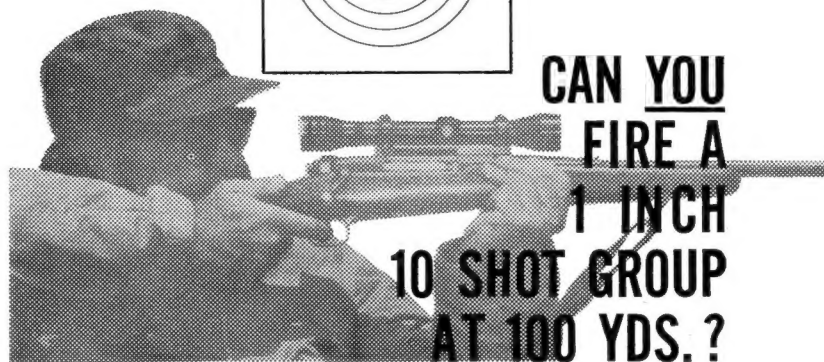
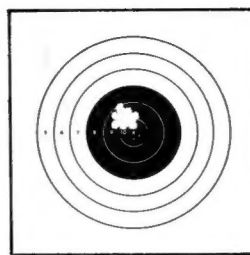


Capacity—25 cases 35-8x35-8
Sizes—Regular and Magnum
(State which when ordering)
Price 39c—3 for \$1.00 Ppd.

Capacity—50 .22 LR Cart.
Size— $4\frac{3}{4}$ x 3 x 1—Wt. 3 oz.
For the 'Plinker'—Target Shooter
Price—\$1.00 Ppd

LLANERCH GUN SHOP, Dept. PS Upper Darby, Pa.

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You will be entitled to receive:



1. A Bronze Lapel or Cap Pin
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Using Sierra Bullets you may fire from any position with any make or caliber of rifle whose weight, with 6-power scope, does not exceed $10\frac{1}{2}$ lb.

Before you shoot be sure and get complete rules and a FREE entry blank from your SIERRA DEALER.

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... for Precision Shooters!

(As formerly offered by Owens of Watkins Glen, N. Y.)

Length: 34 and 36 inches
Depth at butt: 7 inches
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2 1/2" Blank	7 ply	\$15.00
3" Blank	10 ply	20.00
3" Blank	20 ply	35.00
3 1/2" Blank	12 ply	22.50
3 1/2" Blank	25 ply	40.00
4 1/4" Blank	13 ply	25.00

Also!

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2 1/2" Blank	1/16" Maple—1/28" Walnut	\$24.00
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AND Fajens "OLYMPIC"

Free
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... with side thumb rest and thumb hole. Write for prices. Send \$1.00 for Fajen's colorful new catalog of custom and regular style target and benchrest stocks; machine-shaped or completely finished and fitted.

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FREELAND PALM REST, ball type \$13.50

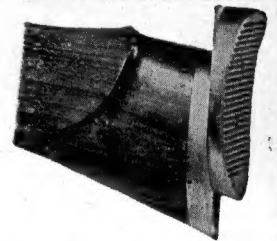


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Swiss Type
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FREELAND SWISS TYPE PALM REST \$18.50
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BALL TYPE PALM REST FOR MARK III \$15.50
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CEDARWOOD DEWAR CARTRIDGE
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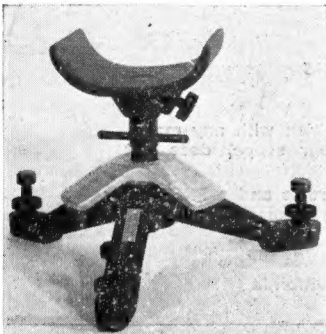


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Aluminum Butt Plate ... \$10.50
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FREELAND Butt Plate with
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Only \$8.50
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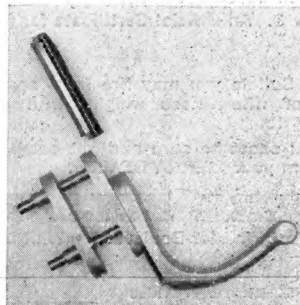
GUNS

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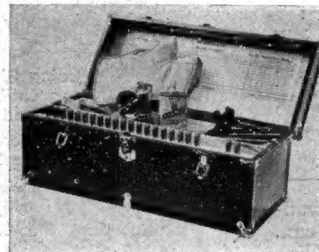


Standard Benchrest Stand \$20.00

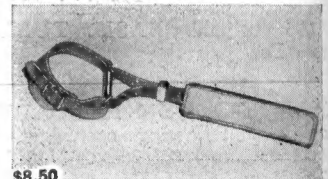
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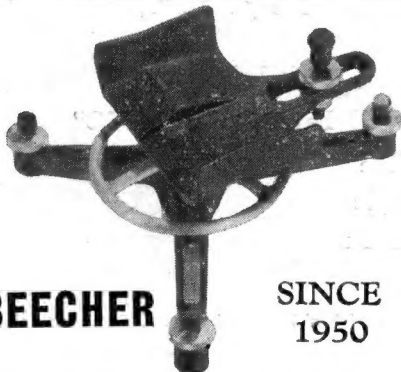
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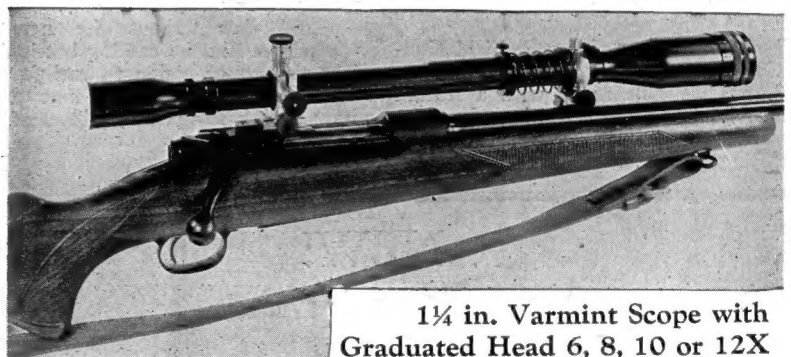
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